

BEADS

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Bead Researchers



2010

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Cover. *Bauxite:* Using a bow drill to perforate bauxite beads at Abompe, Ghana (photo: J. Haigh).

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KARLIS KARKLINS, editor

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BAUXITE MINING AND BEAD PRODUCTION IN GHANA

John Haigh

Abompe is the current bauxite beadmaking site in Ghana and the hills of the Kwahu Plateau above the village are pocked with hundreds, perhaps thousands, of pits dug in search of the raw material. To determine the age of the beadmaking industry in the region, people in Abompe and other villages were interviewed and related stories that suggest the first beadmakers were following the example of people in or around Bepong, a village on the plateau above Abompe. Three areas of bauxite pits on the Kwahu Plateau were investigated to see if there was physical evidence of ancient mining; those currently used by Abompe people and those previously dug by Bepong and Adasowase people. Four boulders with polished upper surfaces were found in the Abompe mining area and are believed to represent large-scale bead polishing. Caves where miners occasionally stay overnight were explored and evidence of bead production in the form of chipping waste was found. Pit counts by transect at Odumparara Bepo, the Abompe mining area, suggest the presence of possibly as many as 4,700 pits. These appear to have been created in the past 100 years.

INTRODUCTION

Bauxite is an impure aluminum oxide formed by intense tropical weathering of silicate rocks such as granite, gneiss, and basalt. Percolating rainwater dissolves more soluble elements leaving behind primarily iron and aluminum ores. The iron oxides give the stone a color that can vary from cream through light pink to brown, red, and purple. Bauxite deposits occur in many forms: soft and structureless or hard. Often, as on the Kwahu Plateau, the bauxite minerals form nodules by accretion. Pisoliths are larger nodules, typically over 1 cm in diameter, and these are used to make beads.

The nodules are misshapen and flawed, the outer surface being uneven. Good beads are made from the core. Unfractured nodules are particularly prized for beadmaking as they can be made into larger, more highly prized beads. The beadmakers distinguish between the most common bauxite and this finer *nsamsoa*.

Bauxite occurs throughout West Africa from Guinea to Nigeria. Three other bauxite-producing areas have been identified for commercial production in Ghana: at Atewa, a

forested hilltop above Kibi in southwestern Ghana, at Awaso in western Ghana, and at Nyinahin, west of Kumasi.

Bauxite beads have been found in archaeological contexts that date to the 1620-1680 period at the ancient Ga capital of Ayawaso (Bredwa-Mensah 1990, cited in Bredwa-Mensah 1996-1997:20). Whether the areas of current bauxite mining on the Kwahu Plateau (Figure 1) could also have been the source of the bauxite forming the beads found in archaeological contexts remains unknown. Kwahu and Kibi are some 100 km north of Accra, while Awaso and Nyinahin are over 200 km to the northwest. Mount Agou in Togo, which is currently a potential site for commercial bauxite mining, is less than 200 km to the northeast. There are also bauxite deposits in Nigeria.

The bauxite beadmaking currently taking place in Ghana is located at Abompe, in Ashante-Akyem (*see cover; Plate IA*). The villagers find stone for the beads by digging pits on the Kwahu Plateau some two-hours climb above the village (Figure 2). It is likely that this community has been making beads for over one hundred years and it is possible that beadmaking or bauxite digging has been taking place in the area for a longer period. Bauxite is the fourth principal source of income for the area following cocoa, coffee, and plantain (Coyle 2008).

Supported by an award from the Guido Scholarship Fund of the Bead Study Trust, I set out to bridge the time gap, collecting oral evidence about the history of beadmaking in and around Abompe and examining the bauxite-mining area on the mountaintop above the town for evidence of ancient beadmaking.

ORAL EVIDENCE

In 1945, Thurstan Shaw (1945:45) stated there were six villages making bauxite beads: Adasowase, Ankase, Osino, Dwenase, Abompe, and Bepong. There were six pits in operation at the Abompe mining area when he visited. Bredwa-Mensah (1996-1997:14) found six pits and 18 people involved in digging there in 1993. In 2009, beads

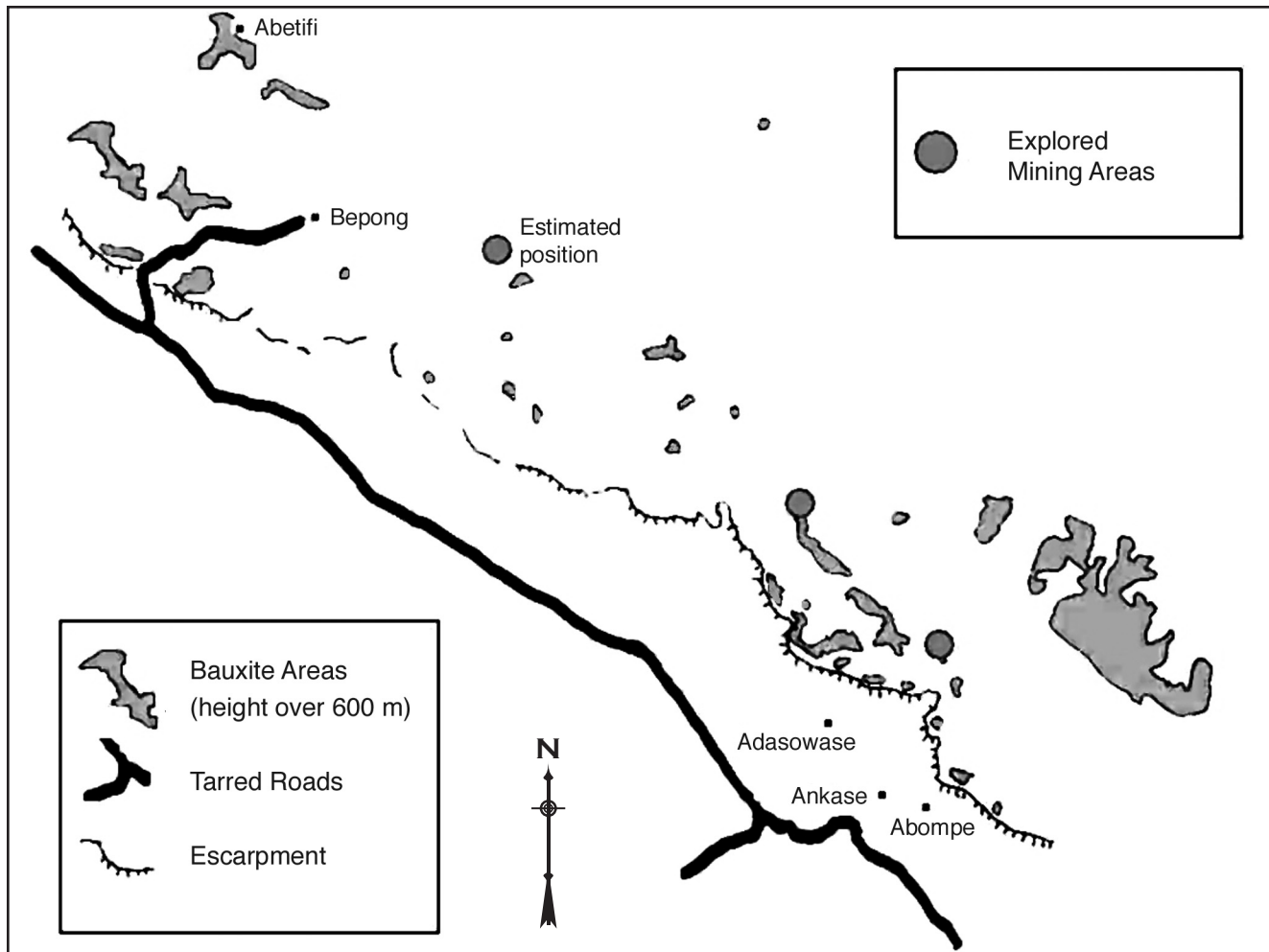


Figure 1. Possible bauxite-producing areas (over 600 m in height) and investigated mining areas on the Kwahu Plateau (all images by the author).

were only made in Abompe, there were only two miners, and only one pit was in operation.

To collect oral histories from the villagers about the bauxite-bead industry, an official approach was made through the regional chief at Kibi who is responsible for the Akyim traditional area. He wrote formally to three of these villages (Adasowase, Ankase, and Abompe) asking that they help. This resulted in interviews with the chiefs of these three villages or their representatives.

In addition, older beadmakers in Abompe were interviewed. These interviews were community led in that one person directed me to another in search of elders who had information and were the most interesting. The interviews were conducted in English or in Twi via a translator, Ben from Dwenase, a town two kilometers from Abompe, who had previously collected oral history about beadmaking for a visitor center in Abompe and is well known to the villagers.

Adasowase and Ankase chiefs and elders said their people no longer make beads and had no knowledge of the history, but an old woman in Ankase, the mother of the chief, gave a detailed explanation of the beadmaking process. Her husband, now dead, used to make beads, but she said no one has made them now for ten or twenty years. She explained how the beads were mounted on umbrella spokes for polishing, an interesting detail, since this is the method described by Shaw in 1945, though nowadays bicycle spokes or the wires found inside tires are used instead (*see cover; Plate IA bottom*). Members of both villages said Abompe would be the best source for information.

Interviews were conducted in Abompe in April 2008 over a period of five days. Some information had been collected previously and additional information has been left out where not directly relevant, though it may have helped establish the reliability of the information.



Figure 2. View of the escarpment from Abompe village.

Kweku Adu, Hunter

Kweku Adu was a 56-year-old hunter staying overnight in a cave on the mountaintop near the bauxite pit area (Koo Osei Cave). He said there were pits on the mountain “when I came, and when my father came, and my grandfather, and my great grandfather also.”

Sam Ofori, Bauxite Digger

Sam Ofori and his partner are the only two bauxite diggers currently operating on the mountain. Sam has been digging pits for 25 years and says he digs 6 pits a year. In a previous interview, he said he dug a pit every month, maybe every two months. He has therefore dug over 100 pits. In his words, “The first man to mine on the hill was called Dowuana. Dowuana was the first man, the elder, the King, in Kwaming Asante’s family.”

Esther Afumaa, Abompe Beadmaker

Esther related that a town in the Kwahu region was the first place they made beads.

A hunter who was from Obomeng or Bepong, and also from Abompe, brought the stone to Abompe to make beads. He was named Doku. He went to Bepong and found them making beads there. He came back and went hunting in the forest. He found that a tree had fallen down and in the soil below the roots he found bauxite which he brought home. He made beads like those he had seen in Bepong. After that he went to dig the bauxite and the hole collapsed so he was killed in the pit. The community members went to look for him and brought him back to bury him. He should have sacrificed a sheep or a goat to the ancestors, but because he did not, he died in the pit to serve as a sacrifice to the land. He taught some other people in the community so after his death they were still making beads.

Sobo Odogiemame Akosua Aku, Abompe Beadmaker

An Abompe beadmaker, Sobo Odogiemame Akosua Aku, related the following story:

Two people went from Abompe hunting and found some bauxite there. When they went to the place

they found a smoking pipe and a bracelet and waist beads. They told the Queen Mother who was Nana Darkwaa, and the elders, and asked what they should do. They were told nothing. And so they worked on it in the house, and it became a family business. And then the man was killed, the hole collapsed on him. They should have made a sacrifice but they had done nothing. If you find something like that in the old days, even if you just visit a place, you have to make a sacrifice as a form of thanks to the land and the ancestors. So the man was taken. They went there and found him and buried him. The other man who survived was called Nana Akokra Atta.

Ben, Guide from Dwenase

My guide Ben had been told the following information:

Many years ago someone in Abompe wrote to the British Administration saying that the people just make beads, they don't do any work. So the government wrote to the village and told them to stop making beads and go to farm. And the Queen Mother stood up. She said she would not allow the government to stop the beadmaking. If she had to risk her life to keep them making beads, she would do it. So they went to the government. 15% of Abompe villagers stopped making beads and went to farm.

Opanin Kofi Asante, Former Abompe Beadmaker

Opanin (elder) Kofi Asante was born in 1923. He started making beads at five years of age and stopped in 2006. His father made beads before him and taught him.

Adyaowo and Nano Akokrata found the beads. They were two brothers from the same family. They were hunters.

In 1940 a Mr Asante, who was a forest surveyor, stopped the beadmaking. In those days the diggers who were from Abompe stayed on the hill top. If you wanted to buy stone from them you climbed the mountain to buy it. They had a small village, like a house, at the top. It was called Kobre. On several occasions he spent the night there. He even spent one Christmas. It was far from the cave (Koo Osei Bodan), close to the Adasowase boundary. The mountain is called Atta ne Atta So. There is a cave there, Atta ne Atta Bodan.

Abompe, Adasowase, and Bepong share the mountain, they share boundaries. Bepong had stopped making beads before he started. Bepong started making beads before Abompe. Each digs in their own areas.

Kwaming Asante, Abompe Beadmaker

Kwaming Asante is a 76-year-old beadmaker with a keen interest in history. On the floor in a corner of his workshop is a wooden bowl for gold panning which had belonged to his grandfather. On his workshop table, among the tools and tins of unfinished beads, are two stone axe heads (celts). He asserts that beadmaking was certainly ongoing before the Yaa Asantewaa War (1900).

In the old days they would carry the beads for two weeks to market. They would walk on bush paths, to markets maybe in Koforidua or Nsawam. The beads were exchanged for salt. That was all that was needed in the villages [the nearby village now called Hemang was once called Fankyeneka: bring salt]. You could set a trap close to the house and get four or five grasscutter [a tasty rodent the size of a large rabbit]. Asante's grandmother was the queen mother who appealed against the ban on beadmaking. Some people threw their beads away rather than risk being found making beads and punished.

Begoro, Osino, Abompe, Hemang, and Otume people were all hunters. They were staying near the railway station [I interpret this as an indication of location, not suggesting that the railway was there at the time. Construction of the railway commenced in 1909, and the first train ran in 1923]. They had a quarrel and split up and went to found the present towns.

Barfoo Nkansah was chief in old Abompe. He brought the people to their present location. The old village, Akurofoso ["old village"] was a kilometer away from the present settlement. People would come and raid the village stealing things, when the men were out at the farm. So they moved to be safer.

Nana Akobeahene and the Abusua Panin

After consultation with other village elders, this official history was related by Abusua Panin, the elder of the ruling family or head of the household, and Nana Ankobeahene, "the chief who stays at home."

Two hunters went to the mountain and saw bauxite there. They brought it to the house to think of making beads. They were Opanin Atta Wuo and Atta Kuma. They grew old, and stopped making beads, and the industry collapsed. Later some young people started to make the beads again. They were Opanin Kotwum, Opanin Kosei, Opanin Apeasa, and Opanin Kwodjo Sekyeama. They were then making waist beads only.

The Abompe people had moved from the old village, Akurofosu, before they started making the beads. Osino, Adasowase, and Ankase people came to learn the beadmaking from Abompe. They formerly made the beads in Aboabo which is now a farm. The name is that of a nearby river, because the land is by the river. The cave is called Kosei cave. People would sit there making beads.

Comments on the Oral History

With regard to other stories collected in the community, the elders said that these came from young people who did not know anything. The elders knew nothing about beadmaking in Bepong.

The stories related in the village about earlier beadmaking may be seen as contradictory but could rather be considered as supplementary. They do not provide a definitive “factual history” but, rather, indicate possible histories to investigate. In three cases they suggest the Abompe people were not the first to make beads from bauxite, and in two, beadmaking is specified as already taking place in or around Bepong.

Supplementary information about the age of beadmaking in Abompe comes from research undertaken by Ben from Dwenase amongst all the current beadmakers in the village. Seven Abompe beadmakers claim to be the first generation of their family to make beads; four trace it back two generations; seven for three generations; and six have been making beads in their family for four generations.

BAUXITE MINING

Abompe Area

Abompe sits in a fertile valley of the gold-bearing Birim River. Above it rises a steep hillside with lower slopes of farmland merging into forest. Vertical cliffs protect the top of the 600-m-high escarpment which forms the Kwahu Plateau (Figure 3). The area on the mountaintop above Abompe is a forest reserve. People climb to collect snails, hunt small game, cut timber, and dig for bauxite, which is allowed in the forest. Now there is just one pair of miners

who climb the mountain to dig for the brick-red, clumpy accretion. They bring a bucket or two of the raw material back to Abompe once a month. Each load, carried on the head (Plate IB top), weighs 35-50 kg but is only worth 10 cedis or about \$10US on a good day (Coyle 2008).

Bauxite occurs as an undulating blanket capping the rock of the Kwahu Plateau. It is found 3-6 meters below the surface in a layer less than a meter thick composed of occasional nodules interspersed among the red laterite soil (Figure 4). Many mining pits remain clearly visible. They are deep with well cut sides that sometimes have clefts in them to serve as hand and foot holds. Older pits have collapsed and are merely evident as surface depressions. The pockmarked surface is quite characteristic.

Seasonal streams cross the plateau, most flowing east towards Lake Volta. Others flow westwards over the cliffs as waterfalls. The streams have cut through the horizontal strata of the bedrock, creating rock overhangs and horizontal clefts in the rock. The miners, and others, may stay overnight on the mountain in one of these caves or rock shelters. There are two caves en route to the Abompe mining area (Figure 5). The largest is a horizontal cleft known as Kosei, or Koo Osei, Cave no more than 1.2 m high, extending up to 6 m into the cliff face, and running for a length of 18 m (Figure 6). The cleft fronts onto a stream bed which in the rainy season can become a wide stream flowing over the cliffs to form the Tini Falls. In April, at the end of the dry season, it contains pools of water from recent rain. The water does not rise to the level of the cave, about 2 m above the bottom of the stream bed, even at the height of the rainy season.

This cave is used frequently and contains modern refuse such as foil medicine capsules, discarded flip-flops, bits of wire, and cloth. There are also utensils in the cave, such as cooking pots and boxes, which are left behind for others to use.

The floor of the cave is mostly solid rock, with an overlayer of dust. A vertical crack contains the bright pink/red chips characteristic of bead production to a depth of about 12 cm, topped by a gray layer, possibly ash (Plate IB bottom). This indicates that bead production had taken place here, though not recently. The amount of chips is roughly similar to what a beadmaking household in Abompe would build up in several years. No grinding stones or surfaces are present in the cave.

A mound of chips up to a meter high and a meter across, covered in vegetation and leaves, is situated at the mouth of the cave. Again, it indicates bead production at some time in the past, possibly over a period of several years by several people.

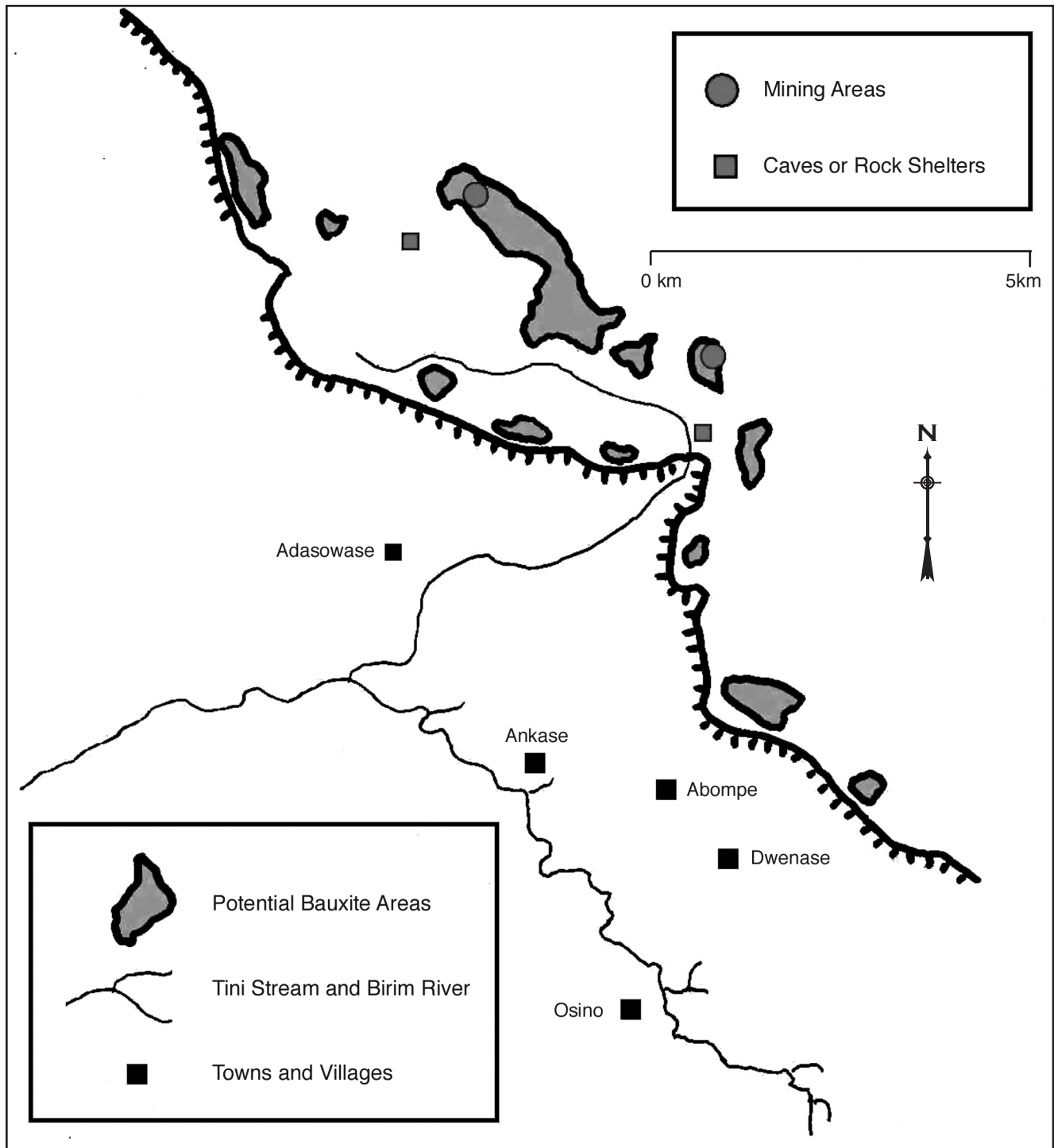


Figure 3. The location of past and present bead-producing villages and their mining areas and caves.

The second cave in the Abompe mining area is smaller and no more than a rock overhang further upstream. It contains pots and rubbish but no signs of beadmaking either in the form of chips from the shaping process or polishing surfaces.

Close to the path running between the two caves are four boulders that exhibit polished, concave areas on their horizontal upper surfaces which are situated a few centimeters above ground level. The concavities are of similar dimensions on all four boulders and consistent with

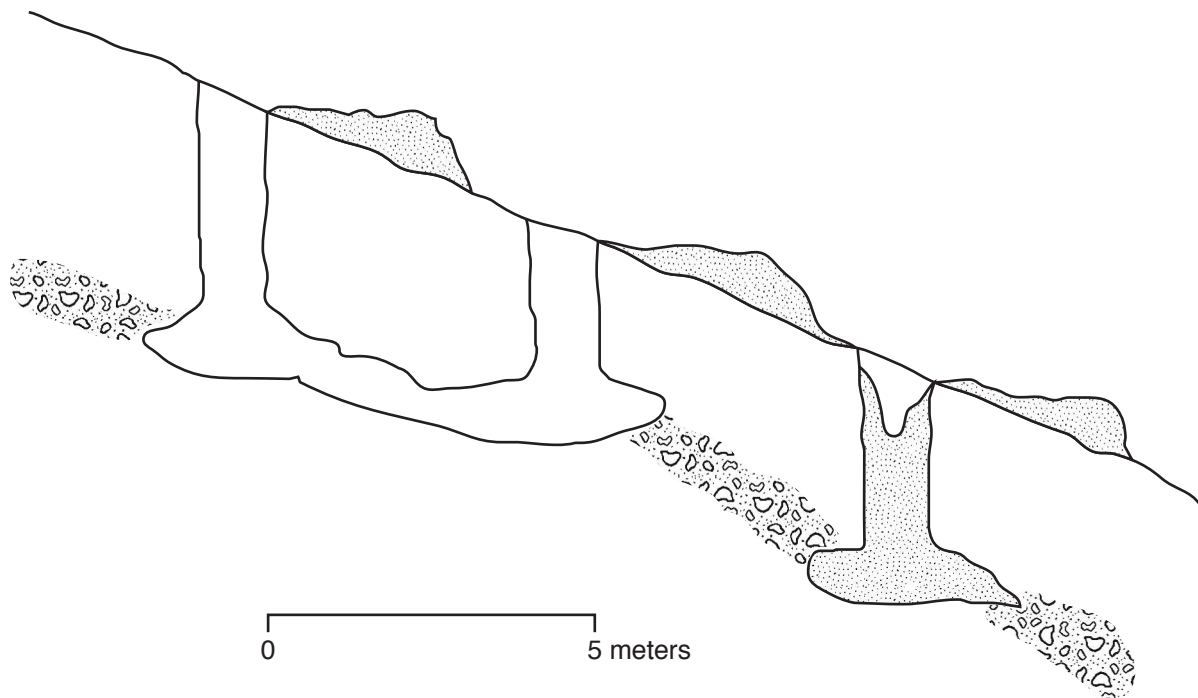


Figure 4. Diagram of typical mining shafts and bauxite-producing levels.

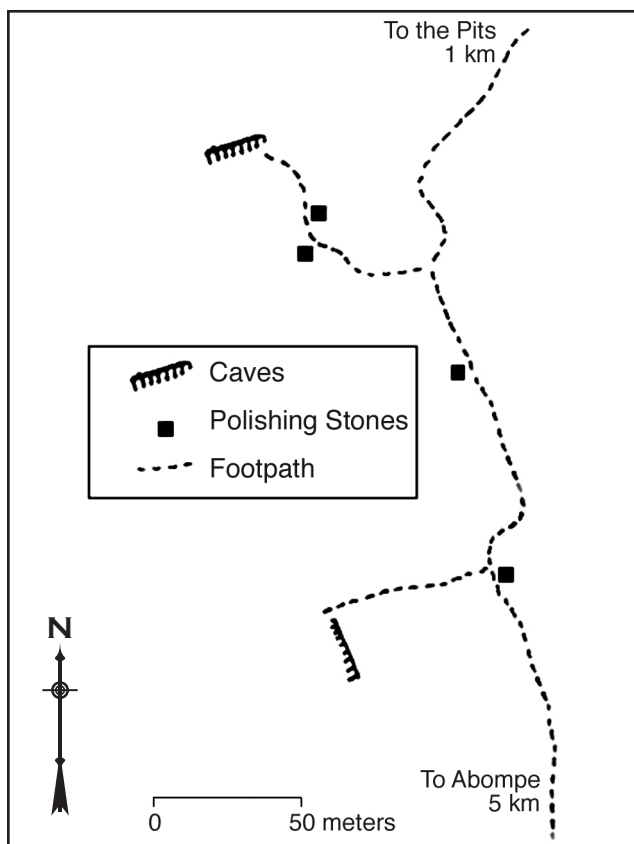


Figure 5. The location of caves relative to polishing stones.

bead polishing. They are not of the size and shape of the grooves created by either cutlass sharpening or the creation or sharpening of stone axe heads.

The first boulder, situated close to the small cave, has a 30-cm-wide polished area. The second boulder is 3 m from the first and has a 60-cm-long polished area (Plate IC top). The third pink rock shows three parallel grooves 55 cm long in a polished upper surface. Here pink and white strata running across the rock clearly show in contour form the three grooves.

Situated nearest the larger cave, the fourth and largest boulder, possibly a bedrock outcrop, had previously been walked past several times without being noticed as it was covered in leaves and moss. It is 4 m long and 1 m wide. About half the surface is polished and shows signs of work in a central area and towards one end, with one long edge and one end being rough-topped like the surrounding rocks. About 1.5 m from one end is a clear U-shaped depression, smooth and even, about 60 cm long and 40 cm wide (Plate IC bottom).

All the polishing rocks were on or beside current footpaths. The rocks were all covered with vegetation, typically 2.5-5.0 cm of leaf mold. On the polished rocks this was easily cleared because of the smooth surface. A search of the surrounding 10 m x 10 m area revealed many flat rocks but all with rough, unpolished upper surfaces. Apart



Figure 6. The rock shelter where hunters and miners stay overnight.

from the area of jumbled rocks, it was difficult to search further without a major effort to clear vegetation.

Adasowase Area

People from the nearby village of Adasowase take a different path to the mountain top and dig in another area. The path is very steep and extends beneath the cliffs before passing through a crack in the face and then there is a rocky scramble to reach the top. There was only one man who knows the way. He had visited there with his father who had worked on clearing and replanting part of the forest some 20 years ago.

Unlike the wild natural forest passed through on the way to the Abompe pits, with clear ground beneath giant trees, here there is an undergrowth of vines and brambles which had grown up since the forest had been cleared, allowing

light to penetrate to the forest floor. There are no paths to follow, apart from the overgrown logging lanes, and it was necessary to cut a route through with cutlasses.

There are two caves—actually small rock overhangs—in the Adasowase area, called Kofi Nka Daban and Agya Nkansa Daban, respectively. A possible polishing stone is located between the two caves. Situated at ground level, its broad, polished, horizontal upper surface exhibits two grooves, narrower at 8 cm across than those found at the first Abompe site. This feature is ambiguous and may be a natural formation.

At the second cave, there is a large mound of bauxite chips measuring 4 m in diameter, and 1.5 m in height on the downward slope and 30 cm on the upward slope. A scatter of chips extends up to 3 m from the edge of the mound. Modern litter, such as pots, flip flops, snail shells, and quartz stones, is also present.

Bauxite chips were found outside both caves. The beadmakers of Abompe examined them and declared that the bauxite from the first cave was good, while that from the second was “dead,” not good enough to work. No polished stone surfaces or grinding stones were found in or close to these caves though there were many flat rocks in the area.

The digging area is similar in appearance to that at Abompe with many collapsed pits and some open ones. According to my guides, the area covers about one hectare or 8,000 m². I looked over an area about 40 m x 40 m (1,600 m²).

Bepong Area

On a visit to Bepong in 2008, I interviewed Opanin Yaw Donkor, aged 75, who remembered seeing his father making beads when the former was between 5 and 8 years old. He described the process and said they started mining in 1938 at Atta ne Atta So because customers had come from Nigeria asking if the villagers would make beads for them. Mining ceased in 1942-1943 when the demand stopped. Beadmakers came from several villages: Mpraeso, Atibie, and Asaka. His father, Opanin Kweku Esi, had built a house to work in. The area rang with the sound of many people chipping and polishing beads in those days. They used big stones to polish them—Opanin Yaw spread his arms wide. Some polishing stones were at a place far away, called Nana Amma Beposo.

A visit to an area of pits on a hill called Ahanta revealed 100-200 pits, as well as the site of a house which had stood there for the beadmakers. Opanin Yaw estimated there were 400-500 pits within an area of 4 hectares.

The Extent of Mining

One way of assessing the possible age of bauxite mining and beadmaking in the region is by determining the number of pits. Sam Ofori and his digging partner have dug 6 pits each year for 25 years. They currently acquire enough stone to supply 24 beadmakers in Abompe. They said that in the past there were up to 30 or 40 pit diggers working on the mountain. This implies that anywhere between 6 and 120 pits could have been dug each year, with 500 beadmakers in Abompe, Dwenase, and Ankase. Thus, depending on the work force in any given year, as few as 600 and possibly as many 12,000 pits could have been dug during the period covered by the living memory of the Abompe community; i.e., since around the beginning of the 20th century.

In an attempt to determine the actual number of pits in the Abompe mining area, a transect was run through the area. This was 230-250 m long by GPS reading, accurate to +/-20 m at each end, and 340 paces by foot or an estimated 220 m. Two people independently counted the pits on either side of the transect to an average distance of 10 m depending on visibility. Thus the area examined was between 4,440 m² and 5,000 m². The total number of pits recorded by the survey group ranged from 156 to 190. Rounding off the lower figure to a conservative 160, this suggests that there is a pit for every 23 m² to 32 m² of horizontal ground surface.

Shaw (1945: 45) observed that horizontal tunnels could extend up to 4 m from the vertical shaft. Sam's most recent pit (Plate ID) has a tunnel 5 m in length connecting it to another shaft, but this is unusual. There are no supports underground so the danger of collapse is increased by longer horizontal tunnels.

The mining pits can be envisaged as circular and closely packed, each with a vertical shaft at the center with one or more tunnels radiating out from it. The close spacing throughout the investigated areas reveals that the miners exhausted existing stone by digging close to previous pits, while ensuring the shafts are not so close as to be weakened. This was seen in both the Abompe and Adasowase mining areas, and later, near Bepong.

Pacing the distance between Sam Ofori's most recent pits gives a distance of 6-10 paces or about 4.0-7.5 m. An average shaft-to-shaft distance of 6 m is consistent with the transect estimate. Based on this distance, there is a pit for every 36 m² of horizontal ground surface. The whole hilltop area above 600 m of this particular Abompe digging site, Odumparara Bepo, covers approximately 150,000 m². Using the low-end density transect estimate of 32 m² per pit suggests that there could be up to 4,700 pits on the plateau. Miner Sam believes the pit area would take 2-3 hours to walk around, but this is not a good quantitative guide. It was not possible to explore the entire hilltop because of thick undergrowth, so it is possible that some areas may not have been mined, but an area of about 16,000 m² separate from the transect area was traversed and contained closely packed pits. Using the estimate of 32 m² per pit suggests that this could contain 500 pits. Over 700 pits have therefore been counted and there may be several thousand pits on the entire hilltop mining area.

CONCLUSION

The bauxite mining areas currently being worked on the Kwahu Plateau may contain several thousand pits, but all of

these could have been produced in the past hundred years. No evidence was found for mining or beadmaking activity prior to the 20th century. Furthermore, there is no reason to assume an unbroken mining tradition at Abompe dating back to the first miners. The plateau has many potential areas where bauxite could be mined. Knowledge of bauxite mining and working could have been passed on from one community to another. Equally, mining could have been stopped and restarted by the same people at different times and places, or by different peoples at the same places.

The existence of polishing stones and debris close to the mines confirms that while pits collapse and become overgrown, other evidence of mining remains. This suggests that traces of earlier mining, that might have preceded bauxite mining and beadmaking at sites such as Ayawaso, could still be evident elsewhere.

Oral evidence suggests that beadmaking took place elsewhere in the area before Abompe started its industry and confirms that the age of the Abompe settlement is relatively recent. It may be that beadmaking was previously carried out atop the escarpment by Kwahu people who settled the area before the Akyem.

Abompe is a relic of historic bauxite mining and working. Other areas on the plateau may contain mines made by communities that have since moved on. Further investigation may reveal traces of ancient mining and the extent of historic bauxite production in the region.

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SIXTEENTH-CENTURY GLASS BEADS FROM CHOTUNA, NORTH COAST OF PERU

Christopher B. Donnan and Jill Siltan

Burials excavated on the north coast of Peru were associated with 16th-century European glass beads as well as shell and stone specimens of local manufacture. The beads were strung as necklaces, bracelets, and anklets, often combining several varieties of European beads with local products. The glass beads as well as the other grave goods suggest that the burials date to the first part of the 16th century, probably between 1530 and 1560.

INTRODUCTION

Five Colonial Period burials dating to the 16th century were excavated at Chotuna (Figure 1), an archaeological site in the Lambayeque Valley of northern Peru, about 14 km northeast of the city of Chiclayo. The site was occupied from approximately A.D. 700 until the 16th century. The associated grave goods include many varieties of European glass beads, as well as shell and stone beads of local manufacture. The burials provide an unusual opportunity to study 16th-century bead assemblages and to observe the different areas of the body on which beads were placed, the relative importance of these areas, and the ways in which different varieties of beads were combined.

In pre-Columbian Peru, beads were made from shell, stone, metal, bone, and seeds. Glass beads did not appear in Peru until they were introduced from Europe in the 16th century. The first arrival of glass beads in Peru is difficult to document. Even before European arrival, some glass beads may have come to Peru through aboriginal trade from Spanish settlements along the Caribbean coast of Columbia or from the Spanish settlement on the Pacific coast of Panama (Smith and Good 1982:10-11). Of particular interest in relation to Chotuna, however, is the expedition of Pizarro in 1532. On his march from Piura to Cajamarca he passed through Cinto, located in the Lambayeque Valley approximately 33 kilometers from Chotuna (Trujillo [1571] 1953:134). Before Pizarro reached Cajamarca, the Inca ruler Atahualpa sent a messenger to him bringing gifts. Pizarro in turn presented the Inca envoy and his men with gifts

that included glass beads (Estete [1535] 1968:368; Trujillo [1571] 1953:136).

The Spanish brought glass beads to Peru in the form of necklaces, strings of beads, and unstrung beads. Beads were given as gifts and they also played an important role in the Spanish system of trade. There is, however, little evidence of how the glass beads either replaced or combined with native beads or how they were used in burials as either offerings or body ornamentation. Thus the Chotuna burial assemblages are of particular importance.

The five Colonial Period burials at Chotuna were found on the east side of a small adobe pyramid (Figure 2). They were in shallow pits dug into a mixture of windblown sand and broken adobe. Each pit contained a single individual. The bodies appeared to have been wrapped in textiles, most of which had decomposed along with other organic material.

THE CHOTUNA BEADS

The Chotuna burials yielded a total of 2,917 beads. Of these, 771 (26%) are glass, 2,143 (74%) are shell, and 3 (0.1%) are stone. These are described below and illustrated in Plates IIA, IIIA, and IVA. Most of the beads are in good condition, although some of the shell beads have started to decompose and a few glass beads exhibit patination.

Glass Beads

The glass beads are of drawn (Varieties 1-19) and wound (Varieties 20-24) manufacture. In the descriptions that follow, the corresponding variety code in the classification system devised for 16th-century Spanish trade beads by Smith and Good (1982) is appended to each variety where possible (M.T. Smith 2011: pers. comm.), followed by the appropriate code in the taxonomic system for glass beads created by Kidd and Kidd (1970) as expanded by Karklins



Figure 1. Overview of the Chotuna site (photo: C. Donnan).



Figure 2. The pyramid where the Colonial Period burials were uncovered (photo: C. Donnan).

(1985)(K. Karklins 2011: pers. comm.). Beads designated with an asterisk (*) in the Kidd system indicate an unrecorded variety. A double asterisk (**) designates a new type. Drawn beads with an alphanumeric designation are similar in all respects except for differing sizes (e.g., Varieties 4A-4D), the presence of patination (8C), or accidental stripes (9C-10C). Square-sectioned tubular beads were only identified as straight or twisted when the beads were long enough for this to be determined.

Drawn Beads

Variety 1. Tubular, square cross section; colorless; 7 mm length and 8 mm diameter; 2 specimens (S&G 49; Ic*).

Variety 2. Tubular, square cross section; green; 3-8 mm length and 4 mm diameter; 3 specimens (S&G IIA1h; Ic9?).

Variety 3A. Tubular, round cross section; dark blue; 6-8 mm length and 2-3 mm diameter; 13 specimens (S&G 2; Ia19/Ia20).

Variety 3B. Tubular, round cross section; dark blue; 4-5 mm length and 3-4 mm diameter; 4 specimens (S&G 2; Ia19/Ia20).

Variety 4A. Tubular, square cross section; dark blue; 6-14 mm length and 0.5-2 mm diameter; 9 specimens (S&G 33; Ic*).

Variety 4B. Tubular, square cross section; dark blue; 3-10 mm length and 2-4 mm diameter; 54 specimens (S&G 33; Ic*).

Variety 4C. Tubular, square cross section; dark blue; 15-59 mm length and 4-6 mm diameter; 10 specimens (S&G 33; Ic*).

Variety 4D. Tubular, square cross section; dark blue; 21-46 mm length and 6-8 mm diameter; 3 specimens (S&G 33; Ic*).

Variety 5A. Tubular, straight, square cross section; turquoise blue exterior/white/colorless core; 9-32 mm length and 4-6 mm diameter; 12 specimens (S&G 51; IIIc1).

Variety 5B. Tubular, straight, square cross section; turquoise blue exterior/white/colorless core; 16-36 mm length and 6-8 mm diameter; 2 specimens (S&G 51; IIIc1).

Variety 6A. Tubular, straight, square cross section; turquoise blue exterior/white/dark core; 4-62 mm length and 4-6 mm diameter; 69 specimens (S&G 40; IIIc*).

Variety 6B. Tubular, straight, square cross section; turquoise blue exterior/white/dark core; 45-50 mm length and 6-8 mm diameter; 3 specimens (S&G 40; IIIc*).

Variety 7. Tubular, square cross section; dark blue exterior/white/colorless core; 3.5-6 mm length and 4-5 mm diameter; 39 specimens (S&G 55; IIIc3).

Variety 8A. Tubular, square cross section; dark blue exterior/white/dark core; 3-10 mm length and 2-4 mm diameter; 113 specimens (S&G 44; IIIc*).

Variety 8B. Tubular, square cross section; dark blue exterior/white/dark core; 5-7 mm length and 4-5 mm diameter; 22 specimens (S&G 44; IIIc*).

Variety 8C. Tubular, square cross section; dark blue exterior/white/dark core; heavily patinated; 12-21 mm length and 8-9 mm diameter; 3 specimens (S&G 44; IIIc*).

Variety 9A. Tubular, twisted, square cross section; turquoise blue exterior/white/colorless core; 8-50 mm length and 4-6 mm diameter; 18 specimens (S&G 59 [facets] or 69 [no facets]; IIIc'*).

Variety 9B. Tubular, slightly twisted, square cross section; turquoise blue exterior/white/colorless core; 33-53 mm length and 7-8 mm diameter; 2 specimens (S&G 69; IIIc'*).

Variety 9C. Tubular, twisted, square cross section; turquoise blue exterior/white/colorless core; one accidental stripe along one edge (*see* Plate IVA); 47 mm length and 8 mm diameter; 1 specimen (S&G 69; IIIc'*).

Variety 10A. Tubular, twisted, square cross section; turquoise blue exterior/white/dark core; 10-28 mm length and 4-6 mm diameter; 52 specimens (S&G 67; IIIc'4).

Variety 10B. Tubular, twisted, square cross section; turquoise blue exterior/white/dark core; 9-61 mm length and 6-8 mm diameter; 13 specimens (S&G 58; IIIc'4).

Variety 10C. Tubular, twisted, square cross section; turquoise blue exterior/white/dark core; one accidental stripe along one edge (*see* Plate IVA); 46 mm length and 7 mm diameter; 1 specimen (S&G 67; IIIc'4).

Variety 11. Tubular, twisted, square cross section; reddish brown exterior/white/dark core; 21 mm length and 8 mm diameter; 1 specimen (S&G IIIA2; IIIc'*).

Variety 12. Tubular, twisted, square cross section; dark blue exterior with 2 red and 2 white stripes on alternating edges/white/dark core (*see* Plate IVA); 14 mm length and 5 mm diameter; 1 specimen (S&G 66; III**).

Variety 13. Round; dark blue exterior with 2 red and 2 white, alternating, twisted stripes/white/dark core (*see* Plate IVA); 6 mm length and 6 mm diameter; 1 specimen (S&G 29; IVb'*).

Variety 14. Tubular, round cross section; 6-layer chevron: colorless exterior/white/light blue/white/light blue/colorless core; dark blue stripes are inlaid between the teeth of the outer white layer; 10 teeth on all inner layers (*see* Plate IVA); 17 mm length and 3 mm diameter; 1 specimen (S&G IVA4; IIIp*).

Variety 15A. Tubular, faceted, round cross section; 7-layer chevron: dark blue exterior/white/red/white/translucent green/white/translucent green core; 12 teeth on all inner layers; 5-9 mm length and 5-8 mm diameter; 100 specimens (S&G 79; IIIk*).

Variety 15B. Tubular, faceted, round cross section; 7-layer chevron: dark blue exterior/white/red/white/translucent green/white/translucent green core; 12 teeth on all inner layers; 7-12mm length and 9-10 mm diameter; 2 specimens (S&G 79; IIIk*).

Variety 16A. Tubular, faceted, round cross section; 7-layer chevron: dark blue exterior/white/red/white/translucent green/white/translucent green core; 18 teeth in the outer white layer and 12 teeth on all other inner layers; 3-9 mm length and 5-8 mm diameter; 77 specimens (S&G 79; IIIk*).

Variety 16B. Tubular, faceted, round cross section; 7-layer chevron: dark blue exterior/white/red/white/translucent green/white/translucent green core; 18 teeth in the outer white layer and 12 teeth on all other inner layers; 9 mm length and 10 mm diameter; 1 specimen (S&G 79; IIIk*).

Variety 16C. Tubular, faceted, round cross section; 7-layer chevron: dark blue exterior/white/red/white/translucent green/white/translucent green core; 18 teeth in the outer white layer and 12 teeth on all other inner layers; 13 mm length and 16 mm diameter; 1 specimen (S&G 79; IIIk*).

Variety 17. Tubular, faceted; square cross section; 7-layer chevron: dark blue exterior/white/red/white/blue/white/translucent green core; 10 teeth in the outer white layer and 12 teeth on all other inner layers (*see* Plate IVA); 10 mm length and 10 mm diameter; 1 specimen (S&G 100; III**).

Variety 18. Tubular, faceted, round cross section; 7-layer chevron: transparent light blue exterior/white/red/white/blue/white/translucent green core); dark blue, red, and translucent green stripes are inlaid between the teeth of the outer white layer (*see* Plate IVA); 12 teeth on all inner layers; 10 mm length and 10 mm diameter; 1 specimen (like S&G 98 except core is green not colorless; IIIp*).

Variety 19. Round; transparent green; 7 mm length and 7 mm diameter; 2 specimens (S&G 13; IIa28).

Wound Beads

Variety 20A. Small doughnut; green; 1-2 mm length and 4 mm diameter; 114 specimens (S&G 105; WId*).

Variety 20B. Small doughnut, conjoined; green; 2-4 mm length and 4 mm diameter; 10 specimens (S&G 105; WId*).

Variety 21. Oblate; yellow; 1-2 mm length and 3-4 mm diameter; 6 specimens (S&G 106; WIb*).

Variety 22. Oblate; black, patinated; 5 mm length and 7 mm diameter; 1 specimen (S&G 14; WIb*).

Variety 23. Oblate; black, patinated; 6 mm length and 10 mm diameter; 1 specimen (S&G 14; WIb*).

Variety 24. Melon (13 pressed flutes); black; patinated; 7-8 mm length and 9 mm diameter; 2 specimens (S&G VIE1; WIIe*).

Shell Beads

Variety 25. Disc; 1-2 mm length and 3-4 mm diameter; 1,119 specimens.

Variety 26. Short cylinder; 2-6 mm length and 4-6 mm diameter; 988 specimens.

Variety 27. Oblate; 3 mm length and 6 mm diameter; 24 specimens.

Variety 28. Long cylinder; 7 mm length and 4 mm diameter; 8 specimens.

Variety 29. Small barrel; 7 mm length and 3 mm diameter; 2 specimens.

Variety 30. Large barrel; 8 mm length and 6 mm diameter; 1 specimen.

Variety 31. Flat square with green stone inlay (*see* Figure 3d); 9 mm length and 4 mm thick; 1 specimen.

Stone Beads

Variety 32. Disc; shale?; 2 mm length and 7 mm diameter; 3 specimens.

Bead Variety Observations

Multilayered beads with square cross sections have lengths that appear to vary according to the exterior color. Beads with a dark blue exterior (Varieties 7 through 8C) are

always short (between 3 mm and 10 mm), while those with a turquoise exterior (Varieties 5A through 6B) are usually longer (between 4 mm and 62 mm, with 88% over 10 mm). About 75% of the multilayered beads with square cross sections (Varieties 5A through 10C) have a dark core, but the core color does not appear to correlate with the outside color. When the bead is three-layered, the second layer is always thin and white. More than half of the straight beads with a light core have one or both ends modified by faceting. Those that are twisted with a light core and those with a dark core have few faceted ends.

Two of the drawn tubular beads (Varieties 9C and 10C) have a “stripe” along one edge. These are the result of glass from the interior being exposed along one edge when the tube was drawn. In both cases, the stripe likely represents the seam where the ends of the exterior layer of glass, applied as a slab, did not completely meet when it was marvered onto the main gather.

Chevron beads (Varieties 14 through 18) have a star pattern visible at the ends that was achieved by the use of molds during the layering process. Except for Variety 14, which is an unaltered tube segment, they have been ground to form either truncated bicones (40%) or double chamfered cylinders (60%). They are faceted on six sides with the exception of Variety 17 which is faceted on four sides. All have seven layers except Variety 14, which has six. The outer layer is almost always dark blue; the exceptions are Varieties 14 and 18 which are cased in colorless or light blue glass. The inner layers of most of the chevron beads (Varieties 15A-15B and 18) exhibit 12 teeth. Three others (Varieties 16A-16C) have 18 teeth on the outer white layer and 12 teeth on all other inner layers. Variety 17 has 10 teeth on the outer white layer and 12 teeth on all other inner layers, while Variety 14 is unique in having 10 teeth.

The wound beads are not very varied with small doughnut-shaped green beads (Varieties 20A-20B) predominating. These are conjoined in ten cases, probably as a result of their touching during the production process.

The shell beads vary in shape and size. Nearly all are discs, cylinders, or barrel-shaped, with round cross sections. The exception (Variety 31), which is carved and inlaid, is almost certainly a Moche bead dating sometime between A.D. 100 and 800—centuries earlier than the other beads in the sample.

BURIAL ASSOCIATIONS

The position of the beads in the graves sometimes indicated how they had been strung; the perforations of the beads remained aligned and the beads still encircled the

neck and/or wrists. With the exception of Burial 3, it was possible to determine the original location of most of the beads in each burial. Some beads were displaced because the stringing material had decomposed and the burial had shifted due to decomposition. These are included in the bead inventory for each burial, but are referred to as having “No Position.” It is possible that some of these represent scattered offerings of unstrung beads.

Burial 1

This burial (field no. A2-T5) was an infant between 10 and 18 months of age, lying on its back in an extended position (Plates IVB-IVC; Figure 3a). A rectangular shell object was near the neck (Figure 3a, b), a bone tube rested on the left shoulder (Figure 3a, c), and small pieces of oxidized iron were present near the center of the chest (Figure 3a). Beads (370 specimens) were found at various points in the grave (Table 1). There were only four beads in the neck area: three small shell beads and one glass bead—the largest chevron bead in the sample (Variety 16C). These may have been strung as a necklace, along with the rectangular shell object.

The right wrist (Plate IVD) was surrounded by beads extending from the wrist midway to the elbow, including 39 shell beads, one of which was elaborately carved (Variety 31; Figure 3d). Most of the beads were glass, however, and included both single-layered and multilayered drawn beads, all three of the drawn green-glass beads (Variety 2), and a unique chevron bead (Variety 14). Wound beads were green (Varieties 20A and 20B), yellow (Variety 21), and black (Variety 22).

The left wrist (Plate VA) exhibited approximately the same number of beads as the right wrist, and the beads were divided about equally between glass and shell. There were fewer unique and unusual glass beads than on the right wrist. All of the drawn glass beads at the left wrist were short and dark blue, and all of the small wound beads were green. The wound beads found at the wrists of this burial constitute nearly half of all the wound beads in the collection. There were a few shell beads at the ankles but no glass beads.

Burial 2

Burial 2 (field no. A2-T6) was an adolescent between 11 and 13 years of age, lying on its back in an extended position (Plate IVB; Figure 4a). The individual had a copper ring around the fourth finger of the right hand (Figure 4b). A total of 784 beads were found in association with the burial (Table 2).

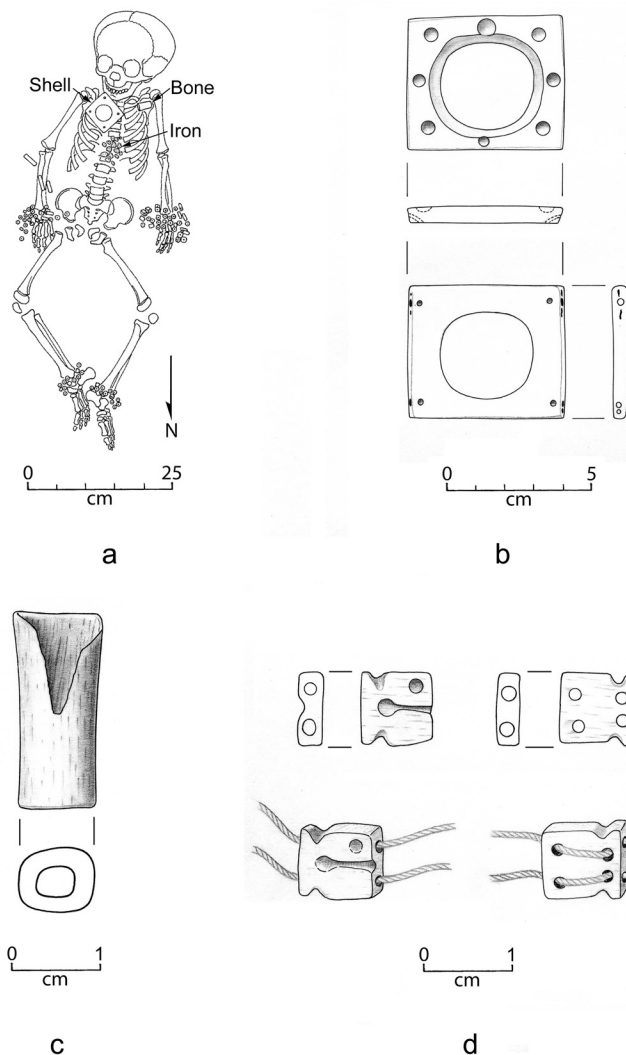


Figure 3. Burial 1: a, burial plan; b, shell object; c, bone tube; d, carved shell bead (all drawings: Jorge Gamboa).

The neck was adorned with a double strand of tubular glass beads, most of which were turquoise (Plate IVB). At the front of the neck was a small cluster of pink shell beads. Encircling the right wrist were 19 rows of beads consisting of 50 tubular glass beads and 513 shell beads. At the left wrist were numerous drawn tubular beads combined with shell beads. There were only a few shell beads at the ankles.

Burial 3

This burial (field no. A2-T7) was an infant, between 6 and 8 months old, lying in a fetal position (Plate IVB). Other than 49 beads (Table 3), there were no associated objects. Because the body was small and tightly flexed it was not possible to determine the original placement of the beads, but the largest concentration appeared to be in the neck area.

The beads were more homogeneous in this burial than in the other four; all the beads were glass and all were drawn tubular varieties.

Burial 4

Burial 4 (field no. A2-T8) was a male between 35 and 45 years of age, sitting in a tightly flexed position (Figure 5a). He was buried with four copper tweezers (Figure 5b) and two ceramic vessels (Figure 5c, d). The copper tweezers were found in the area of the neck and chest, but it was not possible to determine if they comprised part of a necklace. Table 4 identifies the associated 1,597 beads.

Most of the beads at the individual's neck were glass, including 162 chevron beads, 74 drawn tubular beads, and

Table 1. Burial 1 Bead Inventory.

Material	Variety	Neck	R Wrist	L Wrist	Ankles	No Position	Total
Glass	2		3				3
	3A		2	6			8
	4A		8				8
	4B		3	8		1	12
	4C		1				1
	5A		1				1
	6A		7			2	9
	8A		22	38			60
	10A		5				5
	14		1				1
	16A		4				4
	16C	1					1
	20A		29	19		66	114
	20B		3			7	10
	21		6				6
	22		1				1
	Total	1	96	71	0	76	244
Shell	25		14	31	11		56
	26	3	19	33		4	59
	27		4	4			8
	29		1				1
	30					1	1
	31		1				1
	Total	3	39	68	11	5	126
Total Beads		4	135	139	11	81	370

two wound beads. These included all three of the drawn beads modified by heat rounding (Varieties 13 and 19), the only two colorless drawn beads (Variety 1), one accidentally striped drawn bead (Variety 10C), and one of the two striped chevron beads (Variety 18). Only two shell beads were found in the neck area.

At the right wrist were 208 shell beads but none of glass. At the left wrist were 482 shell beads and 26 drawn glass beads. There were no beads at the ankles.

Burial 5

This burial (field no. A2-T9) was an adolescent between 11 and 13 years of age, seated in a tightly flexed position (Figure 6a). The individual was buried with a pair of silver tweezers (Figure 6b) and a ceramic vessel (Figure 6c), as well as 117 beads (Table 5).

At the neck were the remains of six strands of beads: 76 drawn tubular beads, two chevron beads including the only square-sectioned specimen (Variety 17), three wound

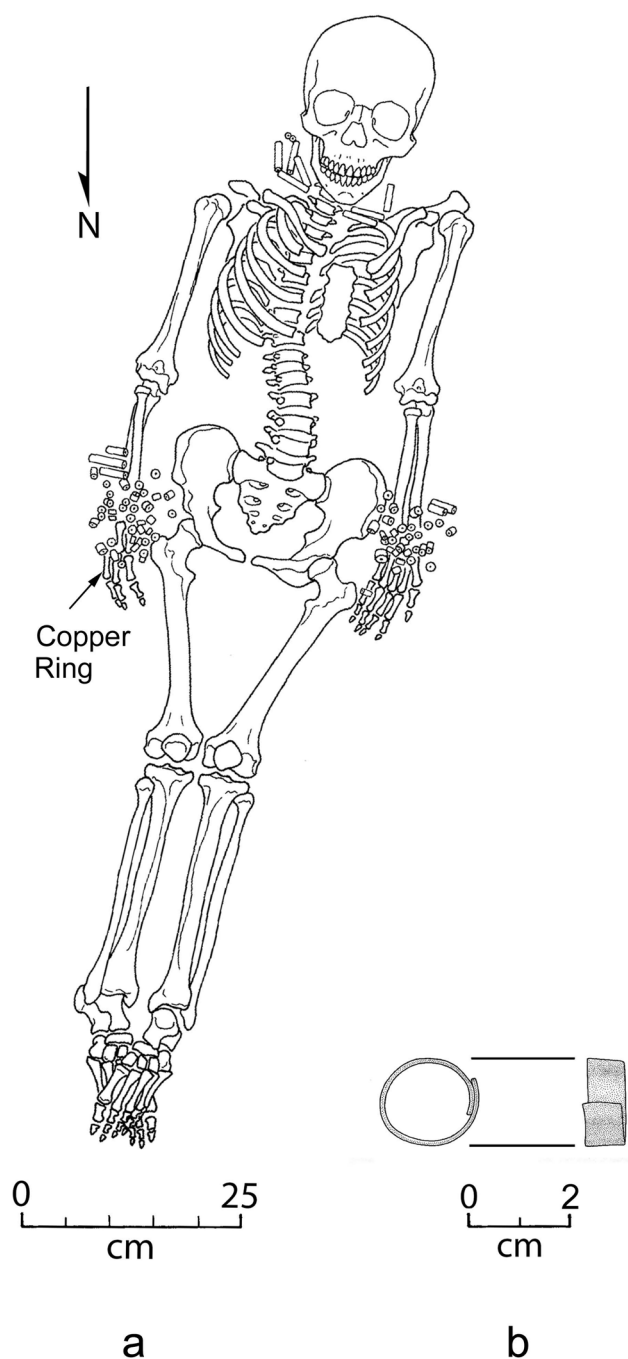


Figure 4. Burial 2: a, burial plan; b, copper ring.

beads, two shell beads, and the only three stone beads in the sample (Variety 32). One tubular glass bead (Variety 12) was deliberately striped. Another (Variety 11) was unique in having a reddish brown exterior, and a third (Variety 9C) was accidentally striped. The silver tweezers found in the area of the neck appear to have served as a central pendant on the necklace. The only two wound beads with flutes (Variety

24) were found adjacent to the tweezers and appear to have flanked it on the necklace.

The right wrist exhibited no beads and there were only 6 shell beads at the left wrist. There were 13 shell beads at the ankles but no glass beads.

BEAD PLACEMENT AND COMBINATIONS

There is no evidence that any of the beads in the burials were sewn to garments, bags, or headdresses. All appear to have been strung as necklaces, bracelets, and anklets. In considering the areas of the body where beads were placed and the way in which beads of different materials were combined, it should be kept in mind that the location of 840 beads (29% of the collection) could not be determined. Of the remaining sample, 912 (31%) were at the right wrist, 765 (26%) were at the left wrist, 364 (12%) were at the neck, and only 36 (0.1%) were at the ankles. This would suggest that the wrists were the most important locations for beads. At the wrists, however, 85% of the beads were shell, 16% were glass, and there were no stone beads, while at the neck 94% of the beads were glass, 5% were shell, and less than 1% were stone. At the ankles 100% of the beads were shell. Since the highest frequency of glass beads was at the neck, one could argue that it was the most important location for embellishment, followed by the wrists and then the ankles.

Only Burial 1 had more glass beads at the wrists than at the neck, but the beads at the wrists were predominantly shell and included almost 65% of the total shell beads in the collection. Only at the right wrist were the beads primarily glass (69%).

There is no evidence that the beads at the right and left wrists were intended to create similar bracelets. Burial 1 had almost the same number of beads on the right and left wrists, but those on the right wrist were predominantly glass, while those on the left wrist were primarily shell. Burial 2 had more than five times as many beads at the right wrist as at the left wrist. Burial 4 had more than twice as many beads at the left wrist as at the right wrist, and only the left wrist had glass beads. Finally, Burial 5 had six beads at the left wrist but no beads at the right wrist.

The combination of glass bead varieties in the burials appears to be random. In Burial 3, where it was impossible to determine bead position, the entire assemblage consisted of drawn tubular beads. In the other burials long tubular beads were often used in necklaces, but the nature of the central ornament, if any, varied. In Burial 2 the central component consisted of long tubular beads with a few pink shell beads. In Burial 5 it appears to have been silver tweezers flanked by wound beads. In Burial 1 a large chevron bead surrounded

Table 2. Burial 2 Bead Inventory.

Material	Variety	Neck	R Wrist	L Wrist	Ankles	No Position	Total
Glass	3A		3	1			4
	3B		3				3
	4A		1				1
	4B		16	4			20
	4C	5					5
	4D	1					1
	5A		1				1
	6A	13	5	1			19
	7			6			6
	8A		20				20
	9A		1	2			3
	10A	2	6				8
	15A					3	3
	16A					11	11
	Total	21	56	14	0	14	105
Shell	25	11	241	56	12	36	356
	26		272	42		6	320
	27					3	3
	Total	11	513	98	12	45	679
Total Beads		32	569	112	12	59	784

by a cluster of pink shell beads probably formed the central feature. There does not appear to have been a central feature on the necklace of Burial 4.

The beads used in bracelets also exhibited great variation. The bracelet on the right wrist of Burial 1 was the only one that combined long tubular beads, chevron beads, wound beads, and a carved shell bead. At the left wrist there were only long tubular beads, wound beads, and shell beads. In Burial 2 both wrists had long tubular glass beads combined with shell beads, but the right wrist had a total of 569 beads while the left wrist had only 112 beads. In Burial 4 only the left wrist had glass beads and in Burial 5 neither wrist had any glass beads.

With only five burials in the sample, it was not possible to determine if the age or sex of an individual correlated with the number or variety of beads. The greatest number (1,597) was found with the adult male in Burial 4, but 82%

of these were shell beads which were probably considered less valuable than glass beads. This burial also had the largest number of glass beads. Of the adolescent burials, Burial 2 had a total of 784 beads while Burial 5 had only 117. Of the infant burials, Burial 1 had a total of 370 beads while Burial 3 had only 49.

DATING THE GLASS BEADS

The glass beads in the Chotuna collection are varieties that are generally attributed to the 16th century (Deagan 1987; Smith and Good 1982). Although more precise dating is difficult, there are some indications that the collection relates to the early part of the century. Chevron beads like those found at Chotuna, which usually have seven layers of glass and sharply cut facets, are generally dated between 1500 and 1590 (Smith 1983, 1987; Smith and Good

Table 3. Burial 3 Bead Inventory.

Material	Variety	Neck	R Wrist	L Wrist	Ankles	No Position	Total
Glass	3A					1	1
	3B					1	1
	4B					9	9
	4C					2	2
	5A					2	2
	6A					9	9
	7					2	2
	8B					4	4
	9A					5	5
	10A					11	11
	10B					3	3
	Total	0	0	0	0	49	49
Total Beads		0	0	0	0	49	49

1982; Smith, Graham, and Pendergast 1994:36). They are distinguishable from chevron beads made near the end of the 16th century, which tend to have only four or five layers of glass and are usually finished by heat rounding rather than faceting (Deagan 1987:65; Smith 1983:148, 1987:33; Smith and Good 1982:53; Smith, Graham, and Pendergast 1994:37).

Large drawn tubular beads which are square in cross section and composed of one or three layers of glass are thought to date between 1500 and 1560 (Deagan 1987:63; Mitchem and Leader 1988; Smith and Good 1982:10-11; Smith, Graham, and Pendergast 1994:36). After 1560, these beads appear to have been replaced by heat-rounded spherical beads. Therefore, the high frequency of large tubular beads and the extremely low frequency of spherical beads in the Chotuna collection suggests that it dates prior to 1560.

In addition, the varieties of glass beads in the Chotuna collection are nearly identical to varieties excavated at the Tatham Mound in Florida, which has been dated to between 1528 and 1539 (Mitchem and Leader 1988:55-58). The similar varieties include long tubular beads, faceted chevron beads, and various wound beads. The close similarity in glass bead varieties at these two sites strongly implies that the Chotuna beads date to the early part of the 16th century, probably between 1530 and 1560, when these beads were widely circulated by the Spaniards.

Some support for this time period is provided by the body position of the burials. For centuries prior to European contact the people on the north coast of Peru customarily buried their dead in a tightly flexed seated position. But soon after their arrival in 1532, Europeans began to convert the native people to Christianity and encouraged the practice of burying individuals in an extended position, lying on their backs. One of the five Chotuna burials (Burial 3) was an infant buried in the fetal position. Two of the others (Burials 4 and 5) were in a tightly flexed seated position while the remaining two (Burials 1 and 2) were in an extended position, lying on their backs. Although this combination of flexed and extended burials possibly could have occurred at any time during the Colonial Period, it seems more likely that it occurred during the first three decades after contact, when traditional practices of the local people were still being followed alongside practices introduced by Europeans.

It is also worth noting that although each of the five burials contained glass beads, only Burials 1 and 4 contained anything else of European origin. The pieces of oxidized iron in Burial 1 (Figure 3a) are clearly the remains of an imported iron object, and one of the ceramic vessels in Burial 4 (Figure 5a, d) has distinctive European features. The scarcity of European objects may be a reflection of more limited access to such goods during the first part of the 16th century than would have been the case later on.

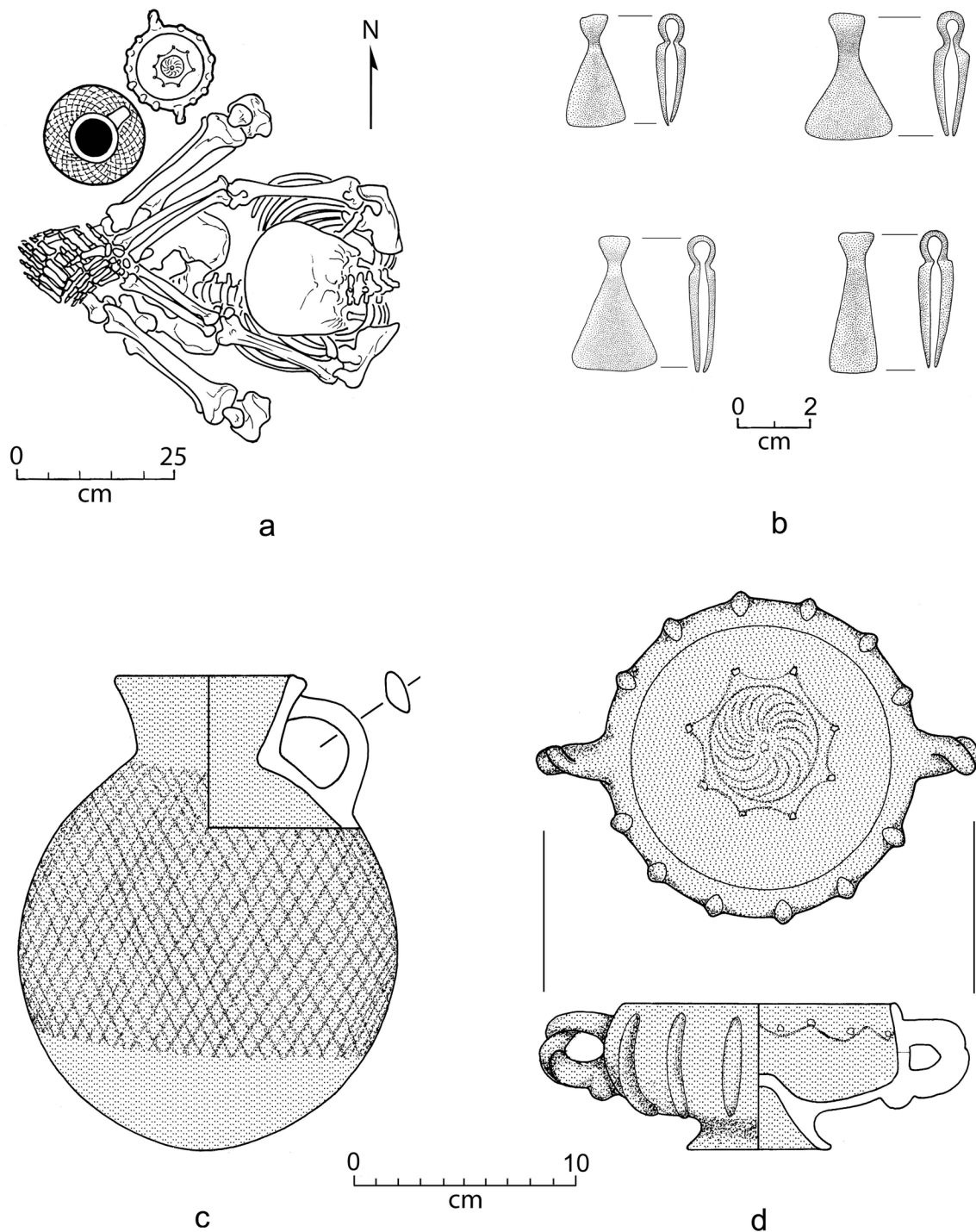


Figure 5. Burial 4: a, burial plan; b, tweezers; c-d, ceramic vessels.

CONCLUSION

The pre-Hispanic Andean custom of using beads for body ornamentation and as burial offerings clearly continued into the early part of the Colonial Period (1530-1560). During

that time, the glass beads introduced by the Europeans did not replace beads made from native materials. Instead, they were used in combination with them to create necklaces, bracelets, and anklets. These ornaments were found on infants, adolescents, and adults. The stone and shell beads

Table 4. Burial 4 Bead Inventory.

Material	Variety	Neck	R Wrist	L Wrist	Ankles	No Position	Total
Glass	1	2					2
	4B	3		10			13
	4C	1					1
	5A	5					5
	6A	3		1		1	5
	6B	2					2
	7	23		8			31
	8A			1			1
	8B	11		2		4	17
	9A	8					8
	9B	1					1
	10A	14		4			18
	10B					10	10
	10C	1					1
	13	1					1
	15A	97					97
	15B	2					2
	16A	62					62
	18	1					1
	19	2					2
	Total	239	0	26	0	15	280
Shell	25	2	61	155		470	688
	26		146	315		147	608
	27			5		7	12
	28		1	7			8
	29					1	1
	Total	2	208	482	0	625	1317
Total Beads		241	208	508	0	640	1597

found at Chotuna represent the antecedents in the Andean tradition, and the association of these earlier forms with European glass beads reflects the interface between the two cultures.

ACKNOWLEDGEMENTS

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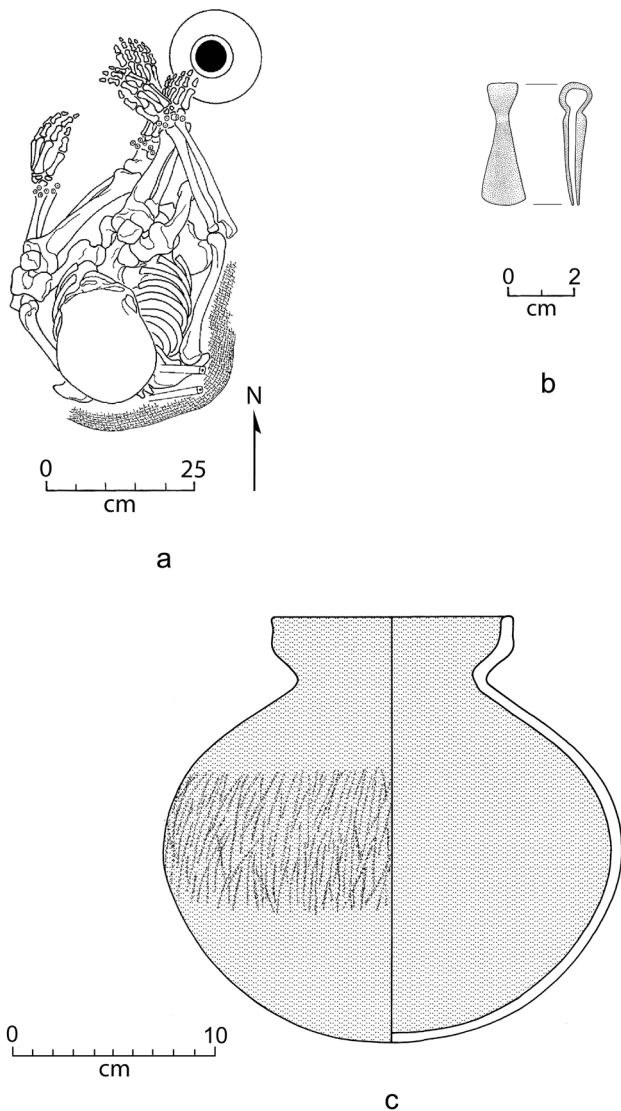


Figure 6. Burial 5: a, burial plan; b, tweezers; c, ceramic vessel.

Allen, Robert K. Liu, Kathleen Deagan, and Karlis Karklins for bringing important bibliographical references to our attention. We also thank Karlis Karklins and Marvin Smith for providing the Kidd and Kidd (1970) and Smith and Good (1982) variety correlatives for the glass bead varieties. Finally, we thank Karlis Karklins for his excellent editorial suggestions.

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Table 5. Burial 5 Bead Inventory.

Material	Variety	Neck	R Wrist	L Wrist	Ankles	No Position	Total
Glass	4C	1					1
	4D	2					2
	5A	3					3
	5B	2					2
	6A	16				11	27
	6B	1					1
	8A	32					32
	8B	1					1
	8C	3					3
	9A	2					2
	9B	1					1
	9C	1					1
	10A	10					10
	11	1					1
	12	1					1
	16B	1					1
	17	1					1
	23	1					1
	24	2					2
	Total	82	0	0	0	11	93
Shell	25	2		6	11		19
	26				1		1
	27				1		1
	Total	2	0	6	13	0	21
Stone	32	3					3
	Total	3	0	0	0	0	3
Total Beads		87	0	6	13	11	117

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LUCAYAN BEADS FROM SAN SALVADOR, BAHAMAS (ca. A.D. 900-1500)

Jeffrey P. Blick, Richard Kim, and Tyler G. Hill

A variety of Lucayan shell, stone, and coral beads as well as beadmaking waste was recovered from several sites on San Salvador, Bahamas. Following detailed analysis, comparisons to other beadmaking sites in the Greater Caribbean region indicate that fabrication, material, color preference, and even general forms are similar across great distances from the Maya region to the Greater and Lesser Antilles and the Bahamian Archipelago. In some cases, beads appear to have been made at the household level (Middle Pre-Classic Maya, Post Saladoid Lucayans), although certain stratified societies (later Maya, Classic Taíno) seem to have exerted more control or monopoly over bead manufacturing at various times. The beads were predominately white and red in color. Color symbolism suggests that white (or shiny) beads were more preferred and associated with peace, the “celestial complex,” gold and silver, the sun and moon, and elite status. Red seems to have been associated with war, the agricultural complex, blood and fertility, the soil and earth, and lower social status. Appreciation of these Lucayan beads includes their beauty, simplicity, symbolism, and the laborious nature of their fabrication, it taking some two months to produce a single strand of a few hundred beads for a single wearer.

INTRODUCTION

Although several scholars have made collections from areas inhabited by the Lucayans and Taíno of the Bahamas Archipelago, including the modern Bahamas and Turks and Caicos Islands (Figure 1), few of them have so far presented systematic analyses of their findings, including shell, stone, and coral beads. Lisabeth Anne Carlson (1993) is one of the few who has managed to describe this bead industry in such detail that she has essentially left us with a guidebook to perform similar analyses on beads from around the Greater Caribbean region. The recovered beads reveal the Lucayans and the Taíno of the Bahamas Archipelago to be some of the most far-flung oceanic trading peoples in the New World. These peoples were also among the most apt and willing to trade objects of local abundance (e.g., parrots, cotton, javelins) to Europeans for some fairly basic materials such as low-value coins (e.g., Portuguese *ceutis* and Spanish *blancas*) and strings of green and yellow glass

beads that were typical items the Spanish traded along the Guinea Coast of Africa, in the Canary Islands, and the newly discovered islands of the “West Indies.” The Spanish avarice for gold was exacerbated by local Lucayans wearing small ear and nose rings of gold or *guanín* (a gold/copper alloy) and by the rumor of a Bahamian “king” or chief dressed in gold living on the island of Samoet, now believed to be Acklins Island. But finding little gold and few riches among the Lucayans, who Columbus complained “were poor in everything,” the Spanish decided to move their search closer and closer to Samoet and eventually to the island of Colba (Cuba), thought to be Japan and near the legendary city of the Great Khan of Asia. Little did Columbus know that he had embarked upon a mission that would change the face of the globe forever. The Columbian Exchange (Crosby 1972) introduced new peoples, new foods, new languages, new diseases, new animals, and new ways of thinking about the world. It was such a dramatic event that this period—known as “The Age of Exploration”—marks the beginning of the age of modern globalization. Despite Columbus’ high aspirations of achieving wealth and fame, we will examine some of the simpler artifacts that have come down to us as one of the legacies of the lost Lucayans.

This article deals with a small, but tangible, group of goods that the Spanish would very likely have traded for with their low-denomination coins, green and yellow glass beads, red caps, red cloth, metal buckles, and hawkbells, all of which so delighted the misnamed “Indians,” namely locally produced beads of shell, stone, and coral. These were among some of the most desirable trade goods the Lucayans could themselves give in return for the paltry gifts showered upon them by the Spanish. The categories discussed include shell bead blanks (bead preforms [the names in parentheses are those utilized by Crock and Bartone 1998]), shell disc beads (discoïd beads), shell “ghost beads,” *Oliva* tinkler beads, cylindrical and tubular beads of shell and stone, and rectangular (barrel-shaped) beads of native coral, items that comprised the personal adornment of the Lucayans of San Salvador. These beads provide insight into the culture, lifeways, aesthetics, social hierarchy, and exchange systems of the pre-Columbian Lucayans and allow us to come to

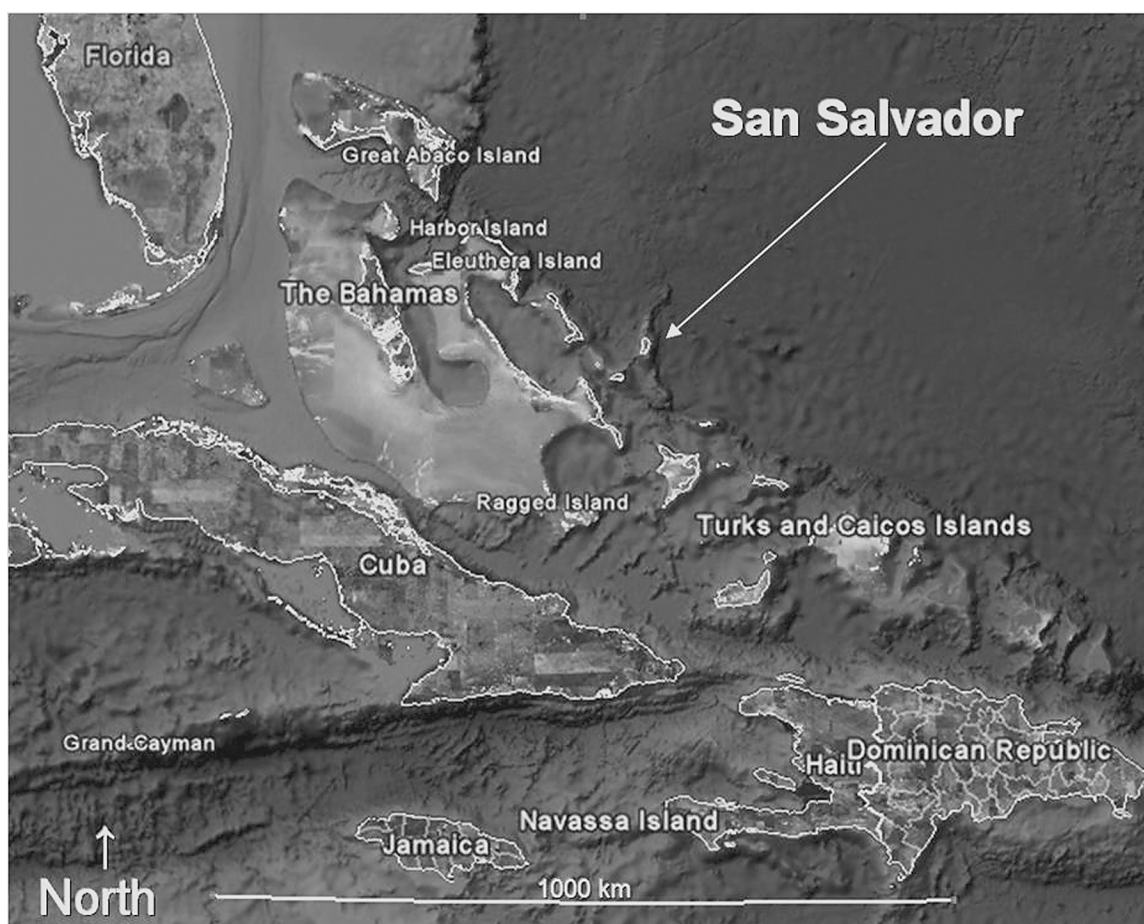


Figure 1. The northern Caribbean region showing the location of San Salvador, Bahamas (J. Blick; GoogleEarth 2010).

know the Lucayans as the long-lost kinsmen of other Native Americans and the first to disappear in the face of the European onslaught (Sauer 1966).

METHODOLOGY

The material described herein represents about eight years of archaeological research on San Salvador and come from the 2003 shovel-testing program at Minnis-Ward (Blick 2003), the 2004 shovel-testing program at the Barker's Point site (Blick 2004), the 2004 5 x 5 m excavation at Minnis-Ward (Blick 2004), the 2005 shovel tests and excavation at North Storr's Lake (Blick and Murphy 2005)(Figure 2), the 2006 4 x 2 m excavation at North Storr's Lake (Blick, Creighton, and Murphy 2006)(Figure 3), the 2009 excavation at Minnis-Ward (Blick et al. 2009)(Plate VB top), and the 2010 excavation at Minnis-Ward (Blick et al. 2010)(Plate VB bottom). Bead provenience is provided below as follows: Site Number/Year-Level or Site Number/Year-Shovel Test Number (e.g., SS-3/04-2 or SS-3/ST3-10).

The recovered beads were typed according to category (blank, circular or disc, "ghost," *Oliva* tinkler, cylindrical and tubular, or rectangular [barrel-shaped]) and then sorted on the basis of raw material (shell, stone, or coral). Beads were sorted into two categories: finished or unfinished (Plate VC top). Finished beads were those that had been through the entire bead manufacturing process (*see below*); unfinished beads were represented by bead blanks. The completeness of the beads was also noted and they were classified as complete ("fully shaped," Crock and Bartone 1998), incomplete (some finishing left to be done), or fragmented (broken).

Measurements were taken using a Helios needlepoint dial caliper with an accuracy of 0.05 mm. Those taken on individual beads included: diameter (of disc or circular beads) and length (longest axis) of squarish, sub-rounded, or "ghost beads;" length (parallel to the perforation in disc or circular beads); thickness (of "ghost" or plate beads parallel to the perforation[s]); width; and drill-hole (bore hole perforation) diameter. If a bead had more than one drill hole, measurements of both were recorded. It was



Figure 2. Screening for artifacts at the North Storr's Lake site (SS-4) in May 2005. This location was a household midden and not a beadmaking locality (photo: J. Blick).

noted if the drill hole was conical or “uniconical” (Carlson 1993; Haviser’s [1990:87, Figure 2] Type I bead hole,) or biconical (Haviser’s [1990] Type II bead hole). One bead had a diagonal drill hole in which the perforation passed through the body of the bead at an angle (Haviser’s [1990] Type V “offset” bead hole). On some beads, horizontal filing or sawing was the means of perforation (e.g., three of the *Oliva* beads). Some of the cylindrical beads were double-drilled and had both longitudinal and transverse perforations. The coral bead was an undrilled blank.

Munsell colors were determined by three persons working together to verify the best color characteristic of each bead. Munsell color names were included so readers would have a better sense of the actual color rather than the numerical Munsell code. It was noted whether or not a bead had been burned or otherwise discolored.

RAW MATERIALS FOR BEAD MANUFACTURE

Raw materials chosen for the manufacture of the recovered beads include *Chama sarda* (red jewel box), *Strombus gigas* (conch), the nacreous *Cittarium pica* (West Indian top shell), *Oliva* sp. (olive shell), *Dentalium* sp. (tusk shell), *Acropora* (coral), and diorite. In this analysis, it is assumed (based on Carlson 1993:13) that any bead exhibiting

a pinkish or reddish color is made of *Chama sarda*. If this assumption is correct, then *Chama sarda* beads comprise 32.4% of the bead collection. Pané (1999:9-10) mentions “red conch [sic] shells, which they wear hanging from their ears,” or tied to a man’s arms or strung around his neck.

A few beads, blanks, and “ghost” beads appear to be made from the silvery nacre of *Cittarium pica* (this identification is based on hours of analyzing artifacts and shells and learning to recognize them by color, texture, and sheen, and validated by Carlson [1993:14]). A light gray “cupped” bead may be *Oliva* as suggested by Carlson (1993:38). It is assumed that the remainder of the “white” beads are manufactured from conch shell based on Carlson (1993), Haviser (1990), Hohmann, Powis, and Healy (2010), and Powis, Healy, and Hohmann (2009). Pané (1999:9) relates that the Taínos of Hispaniola “take another more precious kind [of bead] from the great spiral conch.... That conch they call *cohobo*” (or *cobo*). The beads themselves are called *cibas* (Pané 1999:10, fn. 40). Nevertheless, we realize that Taíno beads were also made from many other shells including *Charonia* (trumpet shell), *Tellina* (tellin), and *Natica* (moon shell), just to name a few (Carlson 1993:14; Ground 2004; Hoffman 1967, 1970). White beads, if indeed as “precious” to the Taíno as Pané described, make up 56.7% of the San Salvador bead collection, almost double the number of red beads.



Figure 3. The final stages of excavation at the sea-turtle butchery at the North Storr's Lake site in 2006. Twenty-five beads and a piece of a carved shell tooth inlay for a wooden zemi statue were found here. This portion of the site dates to ca. A.D. 900-1550 (photo: Kristi Brantley-Smith).

The coral bead appears to be made of a species of *Acropora* based on the worn corallites on the body of the bead. The stone bead is formed from diorite, or as Fray Pané (1999:10) wrote ca. 1498, some "*cibas* [beads] are made of stones much like marble."

LUCAYAN BEADS AND BEAD BLANKS

The recovered beads were analyzed by J. Blick, R. Kim, and T. Hill over a three-day period using a planned and systematic method. The collection is composed of 292 modified shell artifacts including bead blanks and beads of shell, stone, and coral, although the predominant material is shell (290 or 99.3%), followed distantly by stone (1 or 0.34%), and coral (1 or 0.34%). Most of the beads represented in this collection are white, circular, shell disc (discoïd) beads, with five "ghost" beads and blanks (1.7%), four *Oliva* "tinkler" or pendant beads (1.4%), three cylindrical and tubular beads of shell and stone (1.0%), and one rectangular or barrel-shaped coral bead (0.34%).

Shell Bead Blanks (Preforms)

Bead blanks are considered to be the preliminary phase or "preform" stage of shell-bead manufacturing (Haviser 1990:89). All of the bead blanks recovered since 2003 are shell. Of the 32 blanks in the sample, 31 are unfinished (96.8%). Regarding form, 27 (84.5%) are circular discs, 4 are rectangular (squarish) (12.5%), and 1 is amorphous (3.1%). As to completeness, 3 blanks (9.4%) are incomplete (only roughed out), 19 (59.4%) are complete (smoothed and ready for drilling), and 10 (31.3%) are fragmented. Blank diameter/length ranges from 5.20-14.15 mm with a median of 7.95 mm. Blank thickness ranges between 0.90 to 2.75 mm with a median of 1.55 mm. Some blanks with perforations have drill-hole diameters of 0.65-2.10 mm with a median of 0.95 mm. Of the 11 shell bead blanks with complete or partial perforations, 7 have conical perforations (63.6%) while only 4 (36.3%) have biconical perforations. Conical perforations are drilled from only one side, producing a V-shaped hole; biconical perforations are drilled from both sides, producing an hourglass-shaped hole (Carlson 1993; Crock and Bartone 1998; Hoffman 1967).

Two of the blanks are made of conch shell (*Strombus gigas*) (6.3%), 2 are of the West Indian top shell (*Cittarium pica*) (6.3%), and 4 are of the red jewel box (*Chama sarda*) (12.5%). Regarding color, 22 blanks are white (68.8%), 4 are pinkish/reddish (12.5%), 5 are various shades of gray (15.6%), and 1 is very pale brown (3.1%). It is assumed that the white, light gray, gray, and dark gray blanks are made of conch based on ethnographic evidence provided in the ca. 1498 account of Fray Ramón Pané (1999). The gray coloration of an otherwise white shell may have been induced by burning or soil discoloration.

Shell Disc Beads (Discoid or Discoidal Beads)

The 2003-2010 excavations on San Salvador yielded 247 shell disc beads (Plates VC bottom, VD, VIA top). These are primarily circular and range from 2.25 mm to 8.35 mm in diameter, with a median of 4.15 mm. Bead thickness varies from 0.60 mm to 2.15 mm with a median of 1.05 mm and is likely dictated by the thickness of the original shell which may, at least partially, be determined by age and species. Polishing the faces of the beads to some cultural standard may also play a role in the range of thickness. Most (85.0%) of the disc beads are finished, and 89 (73.5%) are complete (fully shaped) while 68 (26.5%) are fragmented.

Drill-hole diameters are remarkably consistent and 95% of them range between 0.85 mm and 0.95 mm with a median of 0.90 mm and a standard deviation of 0.27 mm. This consistency suggests a fine drilling tool, the use of which would have been highly controlled. Carlson (1993), Francis (1988), and Gnivecki (2006, 2009) have suggested the use of pump or bow drills tipped with tiny chert microliths ca. 0.9-1.1 mm in length with tips of similar dimensions. Havis (1990:87) has suggested that small lithic drills, ca. 1-3 cm in length, worked in a rotary motion would exhibit distinctive rotary use-wear striae. These are not observed on the San Salvador chert microliths. The senior author has doubts about the use of such microdrills in beadmaking on San Salvador and suggests that fine cane reeds used with sand abrasive should further be considered.

Seventy-eight (31.5%) of the shell disc beads have conical perforations while the remaining 169 (68.4%) exhibit biconical perforations. Thus beads with biconical holes outnumber those with conical ones by more than 2 to 1. There are several possible explanations for this: 1) the findings may reflect a slight difference in the technologies being used by individual beadmakers; 2) conical drilling may represent the training phase of an inexperienced beadmaker with limited skills; or 3) biconical drilling may have been performed on sacred, ceremonial, or finer trade objects,

whereas conical drilling was relegated to the production of more mundane or local types of beads.

White beads predominate (140 specimens; 56.7%), followed by pinkish/reddish (80 specimens; 32.4%). Light to dark gray beads (27 specimens; 10.9%) probably represent specimens discolored by exposure to dark soil or fire. Forty-four (17.8%) of the disc beads exhibit discoloration possibly caused by burning. Of these, 30 (68.2%) were probably white originally (conch, top shell, etc.), while 14 (31.8%) appear to have been red (*Chama sarda*). Carlson (1993:42) mentions that a small string of beads was found burned in a fire pit at the Governor's Beach site (GT-2), Grand Turk, Turks and Caicos Islands. Carlson (1993) goes on to say that the sacrificial offering of certain ornaments to fire, particularly beads, is a widespread cultural practice found from the Chumash of California, to the Taíno and Lucayans of the Bahamas Archipelago, and even to the African- or Afro-Caribbean-influenced "cremated" glass beads (ca. 1650) found in a cemetery near Santa Elena on Parris Island, South Carolina (South 1983; South, Skowronek, and Johnson 1988).

Shell "Ghost" Beads

Until a standardized name is designated, this bead type is being called a "ghost" bead due to its similarity in appearance to the ghosts that children draw (Plate VIA bottom). The five recovered specimens average 11.55 mm in length, 9.19 mm in width, and 1.39 mm in thickness. The first specimen (Plate VIA bottom, left) (SS-3/04-1) has two conical drill holes or "eyes" 0.60 mm and 0.65 mm in diameter. It is finished, complete (fully shaped), and light gray in color, perhaps the result of burning or soil discoloration. The second bead (Plate VIA bottom, second from left) (SS-3/04-2) is made from the West Indian top shell (*Cittarium pica*) and has two biconical drill holes 1.25 mm and 1.35 mm in diameter. It is finished but fragmented and white in color. The third example (Plate VIA bottom, center) (SS-3/04-2) is an unfinished, fragmented blank with no drill holes. It is white and also made from *Cittarium pica*. The fourth specimen is an unfinished blank (Plate VIA bottom, second from right) (SS-3/04-3) manufactured from a *Diodon* (porcupinefish) oral grinding plate (Dr. William F. Keegan 2010: pers. comm.). It has three biconical drill holes: the two on the obverse side are 1.35 and 1.15 mm in diameter; one of these matches up with the beginning of a 1.65-mm-wide drill hole on the reverse. The bead is unfinished, fragmented, and light gray in color. The fifth and final ghost bead (Plate VIA bottom, right) (SS-3/04-3) is also unfinished, but complete with no drill holes, and appears to be a preform or perhaps a shell-inlay fragment.

“Ghost” beads have also been found in small quantities at the Three Dog site (SS-21) and North Storr’s Lake (SS-4) on San Salvador (Shaklee, Fry, and Delvaux 2007; Mary Jane Berman 2010: pers. comm.). The shell ghost beads are similar in form (although smaller in size) to the single- and double-drilled “tabular” beads from Late Classic Mayan deposits at Tikal, Guatemala (Moholy-Nagy 1988) and to the flat plate beads from the Andean region described by Mester (1988:159) who states that “their primary use was as adornments on textiles.”

***Oliva* Tinkler Beads**

Oliva “tinkler” beads are composed of the body of the *Oliva* or olive shell. The four recovered specimens average 30.45 mm in length and 15.83 mm in width. Tinkler no. 1 (Plate VIB top, left) is white to yellowish white in color. It is finished and, though fragmented at the lip, still retains evidence of a horizontally filed or sawed suspension hole (Carlson 1993; FitzSimmons 1993; Francis 1988:28; Hoffman 1967). Sawing or filing—which “leaves a deep groove which results in an elliptical opening” (Francis 1988:28)—seems to be a common perforation technique for tinklers. Tinkler no. 2 has broken in the area where it was to be filed or sawed to create a suspension hole (Plate VIB top, second from left). The hole is 11.65 mm long and 6.20 mm wide. This bead may have been broken during the manufacturing process or in the post-depositional environment at the site. White in color, tinkler no. 3 (Plate VIB top, third from left) is a finished specimen but also fragmented as the lower half of the shell has been broken off, perhaps intentionally (FitzSimmons 1993; Powis, Healy, and Hohmann 2009; similar to Haviser’s [1990] Type VI “terminal” perforation), to create the hollow “bell-like” noisemaker of the tinkler. Notice, however, that the horizontally filed or sawed suspension hole is clearly visible and measures 3.00 mm in length, very close in size to the perforation on tinkler no. 4. The latter specimen is the only finished, complete tinkler in the collection and is a bright natural white. The horizontal opening is 3.35 mm long. All of the tinklers were filed or sawed near the siphonal canal close to the bottom of the olive shell (*see also* FitzSimmons 1993: Figure 1).

These beads were made to serve as little bells or “tinklers” when worn on the wrists, arms, and ankles (Figure 4). FitzSimmons (1993) asserts that tinklers may also have been worn as necklaces as some Tairona ceramic figurines suggest. Kidder (1932) was the first to call these objects “tinklers.” They have been referred to as “tinkler” beads in the Caribbean/Gulf of Mexico region since about 1946: “*Oliva*

tinklers are a widespread Maya lowland and Mesoamerican trait” (Kidder, Jennings, and Shook 1946:148-149). In his report on the excavations at Altar de Sacrificios, Guatemala, Willey (1972:220-223) stated, “Tinklers are little spiral univalves, either of *Oliva* sp. ... or *Jenneria pustulata*.” The Maya “tinklers” were also perforated: “a portion of the spiral on the bottom [the siphonal canal] was ground or cut away [sawed]” ... for stringing in necklaces, bracelets, and anklets. Some of the Mayan varieties were even carved to resemble human skulls and are sometimes referred to as the “death’s head” shell bead or “death’s head” tinkler. Similar *Oliva* and other tinklers have also been found in the Tairona region of the Caribbean coast of northern Colombia (FitzSimmons 1993: Figure 1). Hoffman (1967:79, Figure 11) and Carlson (1993:16, Figure 2-2b) illustrate *Oliva* pendant beads from San Salvador and Grand Turk, respectively, similar to the ones described here.

Cylindrical and Tubular Beads of Shell and Stone

The three cylindrical and tubular beads of shell and stone are discussed together here based on their morphology rather than their material of manufacture. The first cylindrical bead (SS-3/ST3-10) is made of stone. The bead is finished, complete, and appears to have been manufactured from diorite, white to light gray in color with black speckling. Found in a shovel test during the large-scale shovel-testing program performed at Minnis-Ward in 2003 (Blick 2003), it has such professional manufacturing quality that it resembles a transistor radio component (Plate VIB bottom, left). It is 14.25 mm long and 6.20 mm wide. The bead has been double-drilled longitudinally (Carlson 1993) and the bores measure a consistent 2.60 mm each. The transverse drill holes bisect the stone cylinder nearer one end than the other and are consistently 0.75 mm and 0.70 mm in diameter.

The second bead (SS-3/04-3; Plate VIB bottom, center) is 16.20 mm long and 9.20 mm wide. It is a tubular shell with a natural longitudinal perforation. The openings at the ends are consistently 6.30 mm and 6.65 mm wide. The transverse holes, which act to bisect the tube nearer one end than the other, have been drilled and are 1.35 mm and 1.70 mm in diameter. The bead is finished, complete, white in color, and made from an as yet unidentified shell, perhaps *Vermicularia spirata* (West Indian worm shell) (*see* Sabelli 1979, no. 335).

The third specimen is a possible tubular shell bead (SS-3/04-3, not pictured). It is 7.00 mm long and 3.10 mm wide with what is very likely a natural hole that runs the length of the object. There are no other perforations in the object and it seems to be finished, although it is fragmented. It is bright

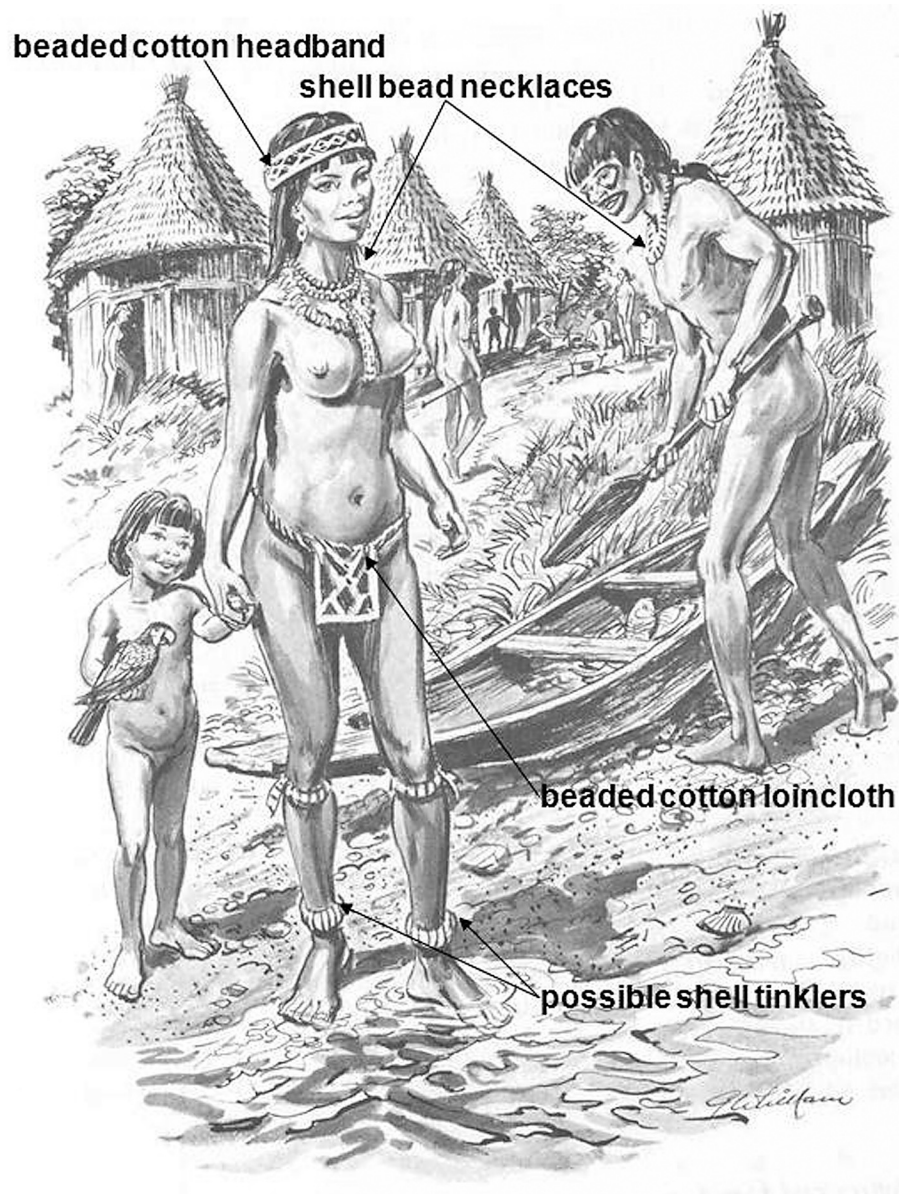


Figure 4. Artist's rendering of a Lucayan domestic scene, illustrating shell beads and bead constructs such as shell-bead necklaces, a beaded cotton loincloth and headband, and possible shell tinkler anklets documented as having been worn by the Lucayans and Taíno (material from "The Story of the Bahamas" by author Paul Albury, copyright © 1975, reprinted by permission of Macmillan Education Limited).

white and appears to be a *Dentalium* shell that may have been worn as part of a chain of beads.

The four-holed or double-drilled beads (with longitudinal holes and transverse drill holes nearer one end than the other) have been reported by Carlson (1993) at the Governor's Beach site (GT-2) on Grand Turk Island. According to Carlson (1993:91), "many stone cylinders were double drilled to hold feathers, creating a feather

choker effect." Columbus' priest/ethnographer, Fray Ramón Pané (1999:10), recorded a myth on Hispaniola in which a "woman... gave [a man]... many *cibas* [beads] so that he would wear them tied to his arms, for in those lands the *cibas* are made of stones very much like marble [diorite?], and they wear them tied to their arms and around their necks...."

Rectangular (Barrel-Shaped or Barrel/Cylinder) Coral Bead

There is some question as to whether this item is a bead as it is unperforated. The object (Plate VIB bottom, right) is rectangular or “barrel-shaped” (or a “barrel/cylinder” bead) (Hammett and Sizemore 1988:132, Figure 7c) and is 20.00 mm long, 11.75 mm wide, and 9.80 mm thick. It appears to be worked (rounded, squared) around the edges to provide its rectangular or barrel-shaped form and may have been shaped in a grooved stone (Carlson 1993). If a bead, this item is unfinished and incomplete. The color is white to yellowish white. It appears to be made of coral, perhaps a species of *Acropora*, such as *Acropora cervicornis* (staghorn coral). This object may be a bead blank that has not yet been perforated. It is similar in form and size to a biconically drilled coral bead (23.00 mm long x 14.00 mm wide) described from the 16th-century Philip Mound, Polk County, Florida by Karklins (1974:4, Figure 2a). Carlson (1993:19) states that “stone beads and especially cylinders are very highly esteemed in the Taíno culture.” In any case, this coral bead blank or barrel-shaped bead is a rarity on San Salvador and in the Lucayan Isles, being one among some 57,000 artifacts analyzed in June 2010.

THE LUCAYAN (TAÍNO) BEADMaking PROCESS

In her comprehensive study of Taíno bead manufacturing based on artifacts from the Governor’s Beach site (GT-2) on Grand Turk, Turks and Caicos, Carlson (1993) analyzed some 20,000 pieces of shell beadmaking debris and beads in various states of manufacture from blanks to finished products. The Lucayans of the Bahamas appear to have been manufacturing beads in the same, or similar, manner as the Taíno beadmakers on Grand Turk. Thus Carlson’s (1993) analysis is an obvious place to look for a comparison of Taíno and Lucayan beadmaking.

According to Carlson, the primary raw material for beadmaking is the red *Chama sarda* (red jewel box) shell followed by queen conch (*Strombus gigas*). On San Salvador, materials involved in the beadmaking process are primarily conch, as on Curaçao (Haviser 1990), followed by the red jewel box: 56.7% of the finished beads are white (assumed to be predominately conch) and 32.4% are red (assumed to be mostly red jewel box). White chert microliths also appear to be associated with bead manufacturing localities on San Salvador (Blick et al. 2009; Blick et al. 2010; Gnivecki 2006, 2009), so we assume a technological similarity in the beadmaking processes between the Taíno on Grand Turk and the Lucayans of San Salvador. The white chert microliths,

or microdrills, appear to have their common source on Hispaniola, an island with demonstrated connections to both Grand Turk and San Salvador (Berman and Gnivecki 1995; Carlson 1993; Keegan 1992; 1997). Microdrills of chert and other materials have been noted in association with shell beadmaking localities from the Mississippian area (Pope 1988; Yerkes 1988) to the Maya region (Hohmann, Powis, and Healy 2010; Powis, Healy, and Hohmann 2009) to coastal Ecuador and Peru (Mester 1988).

According to Carlson (1993), the following stages are involved in the Taíno shell beadmaking process:

- 1) A conch hammer or conch columella point (“knipper,” Keegan 1997) is used to shape a rectangular (squamish) or circular bead blank;
- 2) The flat sides of the blank are polished in a sand-and-water slurry on a flat abrasive surface using an abrasive tool such as a hand-held abrading stone or a sandstone polisher (Mester 1988);
- 3) The blank is then perforated using a chert-tipped bow drill (Francis 1988:32; Gnivecki 2006, 2009) or a pump drill with a drill shaft of wood or cane worked in a rotary motion, or perhaps drilled using a fine, sharpened, wooden reed and a sand abrasive;
- 4) The perforated beads are then strung, ca. 100-300 beads at a time, and rolled (like a rolling pin) back and forth and side-to-side on a flat abrasive surface, using a slurry of sand or pumice and water. This polishes and smooths the outer edges of the beads and produces beads of uniform size. According to Carlson’s (1993) analysis, this final stage removes ca. 2 mm of material from the sides of the beads.

Whether performed with a chert-tipped shaft of reed or cane or a “sharpened hollow reed drill filled with a sand abrasive” (Carlson 1993; Roth 1924), the biconical drilling technique predominates at Governor’s Beach (80% biconical; 20% conical). A similar predominance of biconical drilling is found in the San Salvador sample of shell disc beads (68.4% biconical; 31.5% conical). This suggests that the Taíno and Lucayan beadmakers either preferred the biconical drilling technique for technological reasons (e.g., the perforation was drilled from both sides to avoid undue stress on the blank that might crack it) or aesthetic concerns (e.g., neat perforations for finely made trade beads).

Beads at Governor’s Beach were finished at “cement polishing stations” or “cement blocks” which are man-made surfaces of natural cement formed by mixing seawater and coralline sand (Carlson 1993). The presence of beadmaking debris in and around these polishing stations suggests to

Carlson that beadmakers worked in small groups, perhaps beneath the shade of a shelter for which there is evidence at Governor's Beach (Carlson 1993:49, Figure 2-8). A similar, hard, flat-topped rock surface, thought to be an outcropping of bedrock, was identified at the Minnis-Ward site (Blick et al. 2009; Blick et al. 2010). Such an abrasive surface could certainly have been used as a bead-polishing station.

COMPARISONS TO OTHER SITES IN THE PAN-CARIBBEAN REGION

The Palmetto Grove site (SS-2), San Salvador, Bahamas (Hoffman 1967, 1970) is the nearest source of comparative shell-bead material for the Minnis-Ward and other sites on San Salvador. Based on the recovered ceramics, the site occupation was dated at A.D. 850-1200 by Hoffman. More recent research conducted at the site by Berman and Gnivecki in 1993 focused on the recovery of prehistoric wood and seeds for radiometric dating. Two radiocarbon assays have been reported which place the Palmetto Grove site relatively late in the prehistoric sequence: 570 ± 80 B.P. (cal AD 1410, cal range AD 1280-1460, 2-sigma, Beta-67064) and 380 ± 60 B.P. (cal AD 1483, cal range AD 1430-1654, 2-sigma, Beta-66089) (Berman and Gnivecki 1997).

The 1965 excavations at the Palmetto Grove site produced 57 shell beads and tinklers, most occurring in the 20-30 cm and 30-40 cm levels (Hoffman 1967:109, Table 10, 1970). Included is a "ghost" bead (Hoffman 1967:79, Figure 11). Both conical and biconical drilling techniques were noted in the manufacture of the shell beads: "In some cases it [the bead] is drilled most of the way and then punched out, or the shell is turned around and the hole is drilled from the opposite direction, the latter producing the hour-glass outline" (Hoffman 1967:110). The beads were manufactured from *Oliva*, *Calliostoma*, *Cypraea*, *Chione*, *Codakia*, *Tellina*, Naticidae, and limpet shells. The *Oliva* tinklers had "a groove sawed through one end until it produces a hole" and served as bells or "noise-making beads" which, when strung together, "make tinkling sounds of varying notes" (FitzSimmons 1993; Hoffman 1967:110).

The Governor's Beach site (GT-2) on Grand Turk Island, Turks and Caicos, produced what is probably the largest collection of beads and beadmaking debris from any site in the pan-Caribbean region (Carlson 1993). It dates to ca. A.D. 1100-1200 and yielded some 1,500 whole beads, ca. 430 blanks, ca. 4,000 broken beads (Carlson 1993:28; Table 2-6), ca. 3,400 bead fragments (Carlson 1993:26, Table 2-4), and ca. 13,600 pieces of beadmaking debitage (Carlson 1993:24, Table 2-2). Although a Taíno site with connections to the Greater Antilles (rather than a Lucayan site), Governor's Beach exhibits the same or similar types

of white and red shell disc beads, fashioned from *Strombus gigas* (queen conch) and *Chama sarda* (red jewel box), that predominate in the bead material from San Salvador discussed in this article. At Governor's Beach, 37.3% of the intact beads are white, 12.7% are red, and 50% are gray (discolored or burned). In the San Salvador bead collection 56.7% are white, 32.4% are pinkish/reddish, and only 9.7% are gray.

Beads from Governor's Beach have diameters ranging from <4 mm to >9 mm (Carlson 1993), with the majority falling in the 5-6 mm range; the beads from San Salvador are smaller, with a median diameter of 4.15 mm. The thickness of the Grand Turk beads ranges from <1 mm to >1.75 mm, with the majority falling within the 1.00-1.25 mm range (Carlson 1993); the San Salvador beads range between 0.60 mm and 2.15 mm in thickness with a 1.05 mm median. Grand Turk perforations range from <1 mm to >1.75 mm in diameter with the majority falling in the 1.25-1.50 mm range; those of San Salvador beads do not exceed 2.0 mm with a 0.9 mm median.

Carlson (1993) estimates that an average string of beads intended for polishing would have consisted of 100-300 beads and been about 15-45 cm in length. She calculates that an average beadmaker at the Governor's Beach site would have been capable of making about 5 beads per day and perhaps 300 beads in a two-month period. Thus, in a single season (about two months), a group of 10 beadmakers could be capable of producing about 3,000 beads, enough to make 10 300-bead strings about 45 cm in length, based on the thickness of the Governor's Beach beads. Similarly, Francis (1988:33) reports that a single string of Southwestern Puebloan *heishi* beads ca. 43 cm in length typically takes about two months to manufacture.

Clearly, the Governor's Beach beadmakers on Grand Turk were skilled artisans who worked in what appears to have been a mass-production beadmaking camp. The Lucayans of San Salvador seem to have worked as individuals or as single households at multiple sites or at multiple households within a site. We know from the work of Carlson (1993), Claassen (1988), and others that beads were a symbol of social status and were used in trade, for exchange and currency, in ceremonies (weddings, burials, offerings), and simply for personal adornment. Beadmaking debris from Governor's Beach was predominantly red, suggesting many red beads were made and exported from there. Red is a color rich in symbolism associated with warriors and males (Carlson 1993) in the Caribbean, the Amazon, and elsewhere. Carlson (1993:5) makes a convincing case that the beadmakers of Governor's Beach were males, of the high-ranking elite stratum of Taíno society, manufacturers of highly regarded and symbolically charged trade objects that

were transformed by women into “elaborate finished bead constructs” of cotton textile and other woven constructions (Fig. 5; Plate VIC). Carlson (1993:101) proceeds to tout the value of the Governor’s Beach beads:

If the Taíno did place value on beads based on size and quality, the examples from GT-2 must have been exceptionally valuable. In all the reports of Caribbean beads, I have never found anything smaller than four millimeters.... The very smallest measures 2.4 millimeters across.... Taíno beads were very commonly owned and traded within the elite classes [of Taíno society].

If bead quality is measured by the fineness of the bead, then the Lucayan beadmakers of San Salvador can be said to have made smaller, thinner, and more finely perforated beads than their supposedly more sophisticated Taíno neighbors to the south and west.

Regarding the nature of the color symbolism of the white and red shell beads found at Grand Turk and San Salvador, red is the least common color on both islands. In Ecuador and Peru, red is associated with war, agricultural productivity, female procreative energy, life, blood, and sexuality (Mester 1988). Red is the color associated with the “dark terrestrial complex” and the lower status moiety of Inca society (Mester 1988:162, 164). The white or shiny nacreous color of shell (*Strombus*, the pearl oyster, *Cittarium pica*) is associated with the “shimmering property of reflecting light... that links the pearl oyster with the precious metals and the precious stones, especially quartz crystals” (Mester 1988:157). The white shell or mother-of-pearl nacre is associated with the sun, beauty, moral excellence, and high social status, the highest stratum of Inca society (Mester 1988:160, 161). It is no surprise then that the Taíno referred to themselves as “good and noble” people upon their introduction to Columbus (Anglería 1949). White nacreous shell is associated with the “celestial symbolic complex” of gold and silver, and sun and moon (Mester 1988:161). The Inca name for pearl (and white shiny shells) is *quispe* which means “peace” (Gonzalez Holguin [1608] 1952:6 in Mester 1988:161). The Inca ruler was carried in a white litter, the *quispe rampa*, for peacetime parades of state and royal marriages; he was carried in a red litter, the *pilco rampa*, on his journey to wage war for imperial conquest (Guaman Poma 1980 in Mester 1988).

It is obvious that the colors red and white are complementary opposites: red (war, the agricultural complex, earth, and lower status) versus white (peace, the celestial complex, the sun and the moon, and upper status). This duality of colors and complementary opposites, is magnificently embodied in the emblem of a leader, a Taíno

chief’s *zemi* (spirit) belt made of white and red shells sewn onto cotton cloth (Plate VIC). Caribbean peoples would have brought their color symbolism with them from mainland South America to the islands of the Lesser and Greater Antilles and Bahamas, so this color system duality would likely apply to Taíno and Lucayan concepts of aesthetics. In fact, Mary Jane Berman (2011) has made a similar argument about shiny, celestial objects in the cosmovision of the Lucayans of the Bahamas. We know that *cohobos* (white beads) were more precious to the Taínos and that white beads were two to three times more common on both Grand Turk (37.3% white vs. 12.7% red) and San Salvador (56.7% white vs. 32.4% red).

Stone beads have been found at the Trants site (MS-G1), Montserrat (Crock and Bartone 1998), which dates to ca. 500 B.C.-A.D. 300 and later (Saladoid Period). Although the beads from Trants are stone, bead terminology and manufacturing technology is similar to that used for shell beads (Carlson 1993; Crock and Bartone 1998; Gnivecki 2006, 2009). The beads are made from a wide variety of imported stone such as amethyst, carnelian, feldspar, jadeite, and white quartz. The presence of these exotic stones on Trants implies an early, widespread, pan-Caribbean trade network that reached to the shores of Central America and northern South America (Crock and Bartone 1998). The similarity of tinkler beads—worn as necklaces, bracelets, anklets, or sewn onto clothing, and used as noisemakers or bells (FitzSimmons 1993)—from San Salvador, Grand Turk, the Maya region, and the north coast of Colombia also points to a widespread usage of this bead form from ca. 900 B.C. to A.D. 1500 across a large region of the Caribbean.

Finally, Powis’ work on Mayan beads from the Pacbitun site in Central America provides us with a rather far-flung comparison to Lucayan beads, but it is a pan-Caribbean comparison nonetheless (Hohmann, Powis, and Healy 2010; Powis, Healy, and Hohmann 2009). Pacbitun is a Middle Preclassic (900-300 B.C.) Mayan site in the interior of Belize, about 100 km from the coast. The site produced numerous “modified shell artifacts, including items that would have been attached to clothing or worn as jewelry items” (Hohmann, Powis, and Healy 2010; Powis, Healey and Hohmann 2009:172). Shell objects are made from *Strombus* (conch), *Marginella*, *Oliva*, *Spondylus*, *Dentalium*, and local freshwater snails and mussels (Powis, Healy, and Hohmann 2009:172), materials that are, for the most part, similar to those used by the San Salvador beadmakers. The Mayan shell disc beads range from 5-10 mm in diameter and have ground edges. The size range of the Pacbitun beads is narrower than that of the shell disc beads from San Salvador, although the Pacbitun shell-bead average appears to be larger than the San Salvador average (4.15 mm).

Also present at Pacbitun are Mayan tinkler beads, pendants, and *adornos* (ornaments), along with large quantities of shell beadmaking debris at one particular household, Sub-Structure B-2, which dates to the early Middle Preclassic (Powis, Healy, and Hohmann 2009). Bead production at this household is substantiated by the presence of 5,670 “finished and unfinished shell artifacts, [3,113 pieces of] production debris, and chert tools” (Powis, Healy, and Hohmann 2009:173). The chert tools, some 92 microliths or microdrills, are manufactured from local chert, and are proposed to have been hafted on wooden or bone handles for use in shell beadmaking (Powis, Healy, and Hohmann 2009). The chert microdrills are similar to those purported to be drills by Carlson (1993) and Gnivecki (2006, 2009) on Grand Turk and San Salvador in the Bahamas Archipelago. While beadmaking seems to have been performed at the household level in early Middle Preclassic Pacbitun, by the late Middle Preclassic, bead production may have come to be controlled by a more hierarchical Mayan society, based on the greater uniformity of the later beads (Powis, Healy, and Hohmann 2009). On San Salvador, bead manufacturing seems to have been fairly widespread and performed at multiple households at several sites, and even at multiple households within sites, such as the four to five potential beadmaking households at Minnis-Ward (Blick 2004; Blick et al. 2010). Most of the beads and beadmaking debris at Pacbitun consisted of conch (*Strombus*) shell, as appears to be the case on San Salvador, as well as on Curaçao (Haviser 1990). This dominance of conch as the primary material in Mayan beadmaking at Pacbitun provides some support for our argument that the majority of the white beads found on San Salvador are also likely made of conch shell.

The use of chert microdrills by Mayan beadmakers at Pacbitun also provides support for Carlson’s (1993) and Gnivecki’s (2006, 2009) conclusions that chert microliths from the Governor’s Beach site, Grand Turk, and the Three Dog site, as well as elsewhere, on San Salvador were likely used for drilling shell beads. To the contrary, Berman and Pearsall (2008) and Perry et al. (2007) report starch grains from food processing on similar chert microliths which suggests that they were used in the kitchen and not in the bead workshop. Chert microdrills, if used in the manner described, would “exhibit distinctive rotary use-wear striae” (Haviser 1990:87) which are not apparent on the San Salvador microdrills. This conundrum requires further investigation. Shells were being brought to Pacbitun from the coast 100 km away. That, along with the evidence for exotic shell, stone, and other beads from Grand Turk, San Salvador, and elsewhere, suggests that a widespread trade network crisscrossed the pan-Caribbean region from at least the early Middle Preclassic (ca. 900-300 B.C.), through the Saladoid (ca. 500 B.C.-A.D. 600) and the late prehistoric

period (Post-Saladoid, A.D. 600/800-1500), up until the time of the Spanish arrival at San Salvador in 1492.

CONCLUSION

Other than Carlson’s (1993) seminal work on Taíno beads at Grand Turk, Turks and Caicos Islands, little has been published on beads of the Bahamas Archipelago. Nor has much been written, or much detail provided, about beads in general in the Greater Caribbean region (FitzSimmons 1993:12; Haviser 1990:85; Powis, Healy, and Hohmann 2009:173). Dr. Perry Gnivecki (2006, 2009) of Miami University of Ohio is one of the few scholars today taking a comprehensive, economic, cultural, and high-tech look at Lucayan shell beads (e.g., he is using a high-power digital camera to take very precise measurements of the diameters and drill holes of shell disc beads recovered from his excavations). Gnivecki’s new and precise measurement technique will probably become the standard for bead studies in the very near future.

The present sample of Lucayan beads from San Salvador, Bahamas, is composed of some 292 specimens that were likely used for personal adornment and body decoration (disc beads worn in necklaces, “ghost” beads sewn onto cloth, cylindrical beads adorned with feathers and worn as “chokers,” etc.). Clearly, these objects allow us only a partial view of the entire Lucayan suite of bead types and personal adornments. The tinklers were probably worn during public festivities and dances (*areytos* in the Taíno language) for their “musical” properties. The study of beads and similar personal ornaments allows us insight into intimate choices of body decoration as well as such cultural values as beauty, marriageability, and social status.

Lucayan beads resemble the beads made by the culturally-related Taíno beadmakers from Grand Turk (Carlson 1993), other Antillean beads such as those from Montserrat (at least in form if not in material; Crock and Bartone 1998), and Mayan beads reported from Yucatán sites such as Pacbitun, Belize (Hohmann, Powis, and Healy 2010; Powis, Healy, and Hohmann 2009). These similarities suggest an early, widespread, pan-Caribbean trade network and likely a corresponding shared system of cultural values, such as color preference, concepts of form and beauty, and perhaps even a shared (or similar) cosmovision or world view.

It is perhaps for reasons such as those mentioned above that so many people find beads so compelling. They seem to have almost universal, even if sometimes only superficial, appeal to peoples of all times and places. Beads are highly

personal, even intimate objects, worn close to the body, associated with personal adornment, beauty, and status. At the same time, beads are highly charged symbolic objects that outwardly express cultural values, even the very concepts of heaven and earth. Through the study of their beads, we are privileged to gain insight, if only superficially, into the tantalizing cosmovision of the lost Lucayans.

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THE BEADS THAT DID *NOT* BUY MANHATTAN ISLAND¹

Peter Francis, Jr.

The purchase of Manhattan Island is an unrecorded event dressed in mystery and myth. An examination of the myth and of its history corrects misconceptions that are nearly as ancient as the purchase.

INTRODUCTION

One of the best known and most widely quoted events of early American history is the story of the Dutch purchase of Manhattan Island from its aboriginal proprietors. The incident is often depicted in cartoons, on television, and in other forms of popular media. Nearly all Americans know the simple elements of this tale: Peter Minuit arrived as director-general of New Netherland in 1626, and soon set about buying Manhattan from the natives with twenty-four dollars worth of beads and similar goods. Its outline has been essentially unchanged in histories and text books for generations:

One of the first acts of Director Minuet was to purchase Manhattan Island for twenty-four dollars, at the rate of one cent for ten acres, paid in gay clothing, beads, and brass ornaments (Hendrick 1896:18).

The first important act of Minuit's administration was the purchase of the island of Manhattan from the natives.... From these Indians Minuit bought the whole island, containing about 22,000 acres, for the value of 60 guilders in beads and ribbons.... That must have furnished enough ribbons and beads to give every brave and every squaw a chance [at having some] (Fiske 1899, 1:120).

The famous purchase of Manhattan Island for sixty guilders, or about twenty-four dollars, was by order of the directors in Holland, in their instructions to Verhulst. The money was paid in the usual form of trading goods, knives, beads and trinkets (Andrews 1937, 1:74, n. 30).

He [Minuit] arranged the purchase of Manhattan Island from the Indians. The price of the famous

sale was 60 guilders or 24 dollars' worth of beads and other trinkets (Tyrrell 1963:48).

The transaction is often treated lightly. The thought of one of the world's most valuable tracts of land traded for mere beads tickles the modern funny bone. But this is a misreading of history. Although early explorers did refer to beads as "trinkets," "toys," and even "trash," modern historians should be aware of the role beads played in the settlement of America and their value to the natives. No one has seriously considered the goods used to purchase Manhattan nor attempted to learn more about the beads themselves. Yet it is a matter of importance.

GLASS BEADS IN THE EARLY TRADE

Glass beads played a minor but constant role in the European global exploration beginning in the 15th century. At his first American landfall, Christopher Columbus reported in his journal for 12 October 1492 that he gave away red caps and strings of beads; the natives immediately put the beads around their necks. Following Columbus there were hardly any explorers or settlers coming to America who did not carry beads to give or barter; their journals are replete with references to them (Francis 1984:24-27; Morison 1963:64-65).

The use of European glass trade beads was well established by the time the Dutch were exploring and settling their colony of New Netherland (Figure 1). The leading glass beadmaker of Europe was Venice, Italy, whose beads traveled to all inhabited continents, and were an essential trade item in world commerce for centuries. Other European nations developed rival glass bead industries, including the Netherlands, which had a flourishing beadmaking industry of its own throughout the 17th century (Francis 1979:6; Karklins 1974:64-82; Sleen 1962).

European trade beads were as important to the Dutch in their American colonies as to anyone anywhere. When the Englishman, Henry Hudson, sailed for the Netherlands in 1609, he met natives along the Maine coast who told



Figure 1. The Dutch settlement on Manhattan, drawn by a Dutch officer in 1635 (Lamb 1877, 1:77).

him that they were trading furs to the French for cloth, knives, hatchets, kettles, and other goods, including beads. In New York harbor, Hudson gave away knives and beads in exchange for some green tobacco. Up the “Great River,” which was later named for Hudson, near the present site of Albany, something of a twist occurred when the natives presented him with beads (Purchas 1626, 8:586-594). These were doubtless wampum beads, the highly valued shell beads, which we shall meet later.

Once the New Netherland colony had been established, glass beads figured prominently in the economy of the settlement. The secretary of the colony, Issack de Rasiere, who arrived on 28 July 1626, learned the value of glass beads quickly. In his letter to the Amsterdam Chamber of the West India Company on 23 September of that year, he mentioned the importance of glass beads several times. He had bought ten beaver skins from the Minquac Indians for some cloth, two hatchets, a small quantity of beads (“*een deel corael*”), and some other items. A bunch of beads, strung in hanks, which was a common method of transporting them, figured in the trade between Jacob Jopaz and Pieter Barentsz in which the former had traded European goods for 205 beaver pelts and some wampum (Laer 1924:192, 220).

Along with his letter, de Rasiere sent two strings of beads, one black and one white, to the West India Company as samples, and asked them to send him two or three hundred pounds of similar beads, “as these are much sought after and there are no more here.” He also explained that he had sold the colonists ten to twenty pounds of beads directly because they could use them to trade with the Indians for fresh food, “because they complain so much of the victuals” (Laer 1924:132).

The primary use for these glass beads was decorative. The natives valued them for their ornamental purposes and wore them as jewelry. Trade beads quickly became an integral part of native costume. De Rasiere explained in a letter of 1628 to his friend, Samuel Blommaert, that the Indians used their own wampum as a bride price, and that after the price had been decided upon, the suitor gave his intended, “all the Dutch beads he has, which they call *Machampe*” (Jameson 1909:107).

In short, there is no question about the importance of glass trade beads in the early exploration of America in general nor to the New Netherland settlement in particular. It remains, however, to examine the details surrounding

the purchase of Manhattan Island to determine what sorts of beads were used in the transaction and where they may have been made, whether in Venice, the Netherlands, or elsewhere.

THE DUTCH ACQUISITION OF MANHATTAN

Following Hudson's voyage of 1609, a number of Dutch ships sailed into New York harbor and up the Hudson River to establish temporary fur trading posts. Though the Dutch considered this area of less importance than their holdings in either Brazil or the West Indies, it was included among the responsibilities of the Dutch West India Company, which was organized in 1621. The management of the West India Company was jointly shared by the Dutch parliament, the States-General, and the directors of the company, called "the Nineteen."

The first group of settlers to New Netherland sailed from Amsterdam in March of 1624 with Cornelius May as the captain and first director of the colony. The Nineteen issued a set of instructions to the colonists, which included the orders that they should take special care in their dealings with the Indians. They were admonished to be faithful in their contracts with the natives, and not to "give them any offense with cause as regards their persons, wives or property" (Laer 1924:17). The first colonists settled at three locations: Fort Orange, on the site of modern Albany; Noten or Nut Island, now Governor's Island, in New York harbor; and at High Island, identified with Burlington Island in the Delaware River, south of Trenton, New Jersey (Weslager 1968:6).

In January of the following year (1625), the *Orange Tree* left Amsterdam bound for New Netherland with more colonists. Among them was William Verhulst (also spelled van Hulst), who had been appointed as the second director of the colony. Verhulst had been given written instructions from the West India Company, including a directive about how to deal with claims to the land:

In case any Indian should be living on the aforesaid land or make any claim upon it or any other places that are of use to us, they must not be driven away by force or threat, but by good words be persuaded to leave, or be given something there for to their satisfaction, or else be allowed to live among us, a contract being made thereof and signed by them in their manner, since such contracts upon other occasions may be very useful to the Company (Laer 1924:51-52).

Also arriving on the *Orange Tree* with Verhulst was Peter Minuit. Born of French Protestant parents in Wesel, Germany in 1590, Minuit was, like many explorers of

his day, a mercenary. After he worked for the Dutch he became the director of New Sweden (Delaware). Minuit's assignments in New Netherland were spelled out by the West India Company to Verhulst, who was charged with having Minuit sail up the Hudson and explore the territory, to dig for valuable minerals, and to identify useful products of the region (Laer 1924:49, 75).

The three areas that the Dutch originally settled were found not to be entirely satisfactory. Fort Orange eventually survived, but in its first year had experienced floods. High Island was abandoned, and Nut Island was found to be too small for pasturage. On 22 April 1625, the West India Company sent out Further Instructions to Verhulst to find a better location for the settlement, as well as instructions to Cryn Fredericksz to lay out a fort to be named Amsterdam (Laer 1924:82-129, 132-169). Included in the Further Instructions for Verhulst was a more specific directive about obtaining land:

And finding none but those that are occupied by the Indians they shall see whether they cannot, either in return for trading-goods or by means of some amicable agreement, induce them to give by ownership and possession to us, without however forcing them thereto in the least or taking possession by craft or fraud, lest we call down the wrath of God upon our unrighteous beginnings (Laer 1924:106).

After the Further Instructions of 22 April 1625, there are no known documents concerning New Netherland for over a year. A letter written by Minuit to Barentsz on 11 May 1626 revealed his intentions to buy Manhattan in the near future (Gehring 1980:6-7). The next evidence which has survived are three documents associated with the passage of the *Arms of Amsterdam*, which sailed from New Netherland on 23 September 1626, and arrived at Amsterdam on 4 November. All of these three were written after the purchase.

One of these is the letter of de Rasiere, to which we have already referred, written on 23 September 1626, the day the ship left the colony. De Rasiere made no mention of the Manhattan purchase, which he surely would have done had it been affected while he was in New Netherland; the purchase must have taken place before his arrival on 28 July 1626.

The second document is the only contemporary evidence for the purchase of Manhattan, and allows us to place the date of the purchase back a bit further. It is a letter written by Peter Schagen, a member of the Nineteen of the West India Company, to the States-General on 5 November 1626, which recounts the news he had gathered from the crew and passengers on the *Arms of Amsterdam* after it arrived. It says in part:

They report that our people are in good heart and live in peace there; the women have also borne some children there. They have purchased the Island Manhattes from the Indians for the value of 60 guilders; 'tis 11,000 morgans (about 22,000 acres) in size. They had all their grain sowed by the middle of May, and reaped by the middle of August. They send thence samples of summer grain; such as wheat, rye, barley, oats, buckwheat, canary seed, beans, and flax (O'Callaghan 1856, 1:37).

The third piece of evidence is the description of the colony which Nicolaes Wassaenaer gathered from the people on the *Arms of Amsterdam* and used for his *Historisch Verhael*. He reported that the plans for the fort had been laid out, a sawmill and a windmill had been built, and New Amsterdam was a bustling community (Jameson 1909: 83-86).

The date of 22 April 1625, when the Further Instructions were written, has been accepted by the City of New York as the official date for its founding. A City Council resolution of 8 January 1975 proclaimed 1975 to be the 350th anniversary of the city, owing largely to the efforts of the Holland Society. The date of the city's founding on its seal and flag, which until that time had been 1664, the year when the English took over from the Dutch, was also changed to 1625 (Zabriskie and Kenney 1977a:11-14).

The date and circumstances of the purchase of Manhattan are not fully revealed by the surviving evidence. Some historians had believed that Minuit was not director-general of the colony when it was bought and that it was purchased while William Verhulst was in charge, although Minuit or Adrien Theinpont may have negotiated the contract (Zabriskie and Kenney 1977b:12). Verhulst was sent home in disgrace on the *Arms of Amsterdam* because of his inconsistent, poor administration (Laer 1924:176). However, documents recently uncovered in the New York State Library at Albany by Charles Gehring, including the letter to Barentsz from Minuit, show that Minuit was director-general of the colony when Manhattan was bought and that the purchase was probably made shortly after 11 May 1626, so that the grain could be sown by mid May as Schagen reported to the Nineteen.

The basic documents for the study of New Netherland were discovered by Harmanus Bleeker, an Albany Dutchman, who served as the ambassador to the Netherlands under Martin Van Buren, himself a New Yorker of Dutch descent. In 1839, Bleeker persuaded the New York legislature to send his secretary, John R. Brodhead, to Amsterdam to transcribe materials in the state archives. Three years later Brodhead returned with a rich harvest of papers which were translated and edited by E.B. O'Callaghan and published

in *Documents Relative to the Colonial History of the State of New York*, under the authority of another act of the state legislature.

Brodhead knew that some material had been removed from the Dutch archives and sold as waste paper and was presumed lost to historians. In 1910, however, six documents written between 1624 and 1626 were offered at auction, including the instructions to May, the Further Instructions to Verhulst, the de Rasiere letter of 1626, and the letter to Cryn Fredericksz about building Fort Amsterdam. They were bought by Henry Huntington, translated by A.J.F. van Laer, and published in California in 1924. These *Van Rappard Documents*, as they are commonly called, are a valuable supplement to the papers Brodhead transcribed.

As we have seen, the documentary evidence for the purchase of Manhattan is extremely scanty. No deed has survived, although the West India Company specifically instructed that a deed be secured. Unless the deed for Manhattan surfaces sometime in the future, an unlikely though not impossible event, we shall never know the terms of purchase beyond the fact that the Dutch valued its worth at sixty guilders. However, some idea of what may have been used for the purchase of Manhattan can be gathered from the record of the purchase of Staten Island.

BEADS IN THE PURCHASE OF MANHATTAN?

The original deed to Staten Island has not survived either, but before it was lost a copy was made by Cornelius Melyen. It shows that Minuit and five other colonists bought the island on 10 August 1626. The natives, who were represented by seven named leaders, received for the island, "Some Diffies [duffles; that is, cloth], Kittles [kettles], Axes, Hoes, Wampum, Drilling Awls, Jews Harps, and diverse other wares, which were all particularized" (The Melyen Papers" 1913:124)(Figures 2-3).

These objects may seem of little worth to us, especially compared to real estate, but to the natives, who had no concept of the possession of land, they were of great value. Cloth and metal items were scarce and novel and, especially in the case of kettles, hoes, and axes, were generally superior to their own equipment. Jews harps are not really necessary items, but even small musical instruments were no doubt greatly admired. Drilling awls can be used for a number of tasks, but of the uses to which they may be put, the manufacture of wampum was probably foremost. The natives of New York harbor and southern New England were the producers of this highly prized bead (Figure 4). The ease of drilling shell with European metal drills rather than with stone implements was an important factor in the growth of wampum manufacturing and trade.



Figure 2. Depiction of the purchase of Manhattan Island from Wilson (1892, 1:152).



Figure 3. The purchase of Manhattan Island as portrayed in Lamb (1877, 1:65).



Figure 4. Wampum recovered from the Seneca Power House site (ca. 1635-1655) in western New York State (courtesy: George Hamell).

It is important to note here that no glass trade beads are named in Melyen's abbreviated copy of the Staten Island deed. They may have been included in his "other wares" category. But even if they had been, they were clearly not an important component of the purchase price.

The beads which are mentioned in the Staten Island deed are the native-made wampum beads of shell. It is impossible to overstate the importance of wampum to the Indians and European colonists during this period of American history. The Dutch recognized the value of these small shell beads so well that a string of wampum encircling a beaver was used on the official seal of New Netherland.

The juxtaposition of the beaver and the wampum string was most appropriate. The Dutch were geographically positioned so that they could easily gain control of the wampum trade, as the Indians of eastern Long Island and Narragansett Bay were the main producers. This they sought to do early because wampum could be traded inland for pelts which would yield a 900 percent profit in Europe.² Soon after his arrival, de Rasiere recognized the value of wampum. His letter of 23 September 1626, informed the West India Company:

[The French Indians] come to us for no other reason than to get wampum, which the French cannot procure unless they come to barter for it with our natives in the north.... I shall know how to get wampum and to stock Fort Orange in such a way that the French Indians will never come there in vain.... I hope this winter before the frost sets in to stock Fort Orange with a thousand yards of wampum, nearly all of which I have in my possession (Laer 1924:223-224, 227).

De Rasiere also introduced wampum to the Plymouth settlers in 1628. They soon recognized its value so well that the first Euro-Indian war, the Pequot War of 1637, was waged largely over who would control the wampum trade. Wampum became currency throughout the colonies, and was still legal tender in New York as late as 1701 (Bradford 1966:203; Fernow 1893, 4:299; Josephy 1982:32-75).

It is, however, doubtful that the Indians regarded the wampum given to them for Staten Island as payment in the sense of currency. The monetary use of wampum was a European invention, necessitated by the acute coin shortage of the colonies. The Indians were more likely to have regarded the wampum as a sign of agreement. The use of

wampum to ratify treaties and other compacts was an Indian conception, and not appreciated by the Europeans until some time later.³ Lending support to this supposition was the inclusion of drilling awls in the Staten Island purchase price, most probably used primarily to make more wampum.

THE BEAD MYTH

The foregoing shows that there is no documentary evidence that even suggests that European trade beads were used to buy Manhattan Island. Nonetheless, the association of beads with the Manhattan purchase is commonplace. An enumeration of sources asserting this would be too tedious to list, but a few additional samples can be offered. J.G. Wilson's *Memorial History of the City of New-York* (1892) says, "...the glittering beads and baubles and brightly colored cloths filled the minds of the simple Indians with delight" (Wilson 1892, 1:158).

A generation later James Sullivan (1927, 1:157), obviously influenced by Wilson, wrote in his *History of New York State*, "Glittering beads and baubles, brightly colored cloths, glittering trinkets of small value brought from the ships nearby in chests, and opened on the shore before the eager eyes of the aborigines, were what worked the miracle."

Current New York State school history texts repeat the story. *The New Exploring American History* by Schwartz and O'Conner (1981:60) says, "Peter Minuit bought the island of Manhattan from the local Indians. Minuit paid \$24 worth of colored beads and trinkets for the island."

And, of course, those interested in beads, such as Erikson (1969:22) in her *The Universal Bead*, share in the myth: "...and included in the barter for Manhattan, as we have all been taught, were strings of glass beads."

And so *have* all Americans been taught. But where did the story originate? Certainly not from the available evidence.

One of the earliest histories of New York was William Smith, Jr.'s *History of the Province of New York*, published in 1757. Smith mentions neither beads nor anything else used to buy Manhattan because the purchase was not known to him. Washington Irving's (1809) *Diedrich Knickerbocker's A History of New-York*, based largely on Smith and the source of many early New York myths, also makes no mention of any purchase. The first historian to write about the purchase of Manhattan was N.C. Lambrechtsen, whose *A History of the New Netherlands* states that Pavonia and Hoboken (both in New Jersey), Nut Island, Staten Island, and Manhattan Island were all bought from the Indians. Lambrechtsen

must have studied the Dutch archives; the work appeared in Dutch in 1818 and was translated into English in 1841 (Kemp 1841:91). His work, however, had no affect upon American historians.

Joseph W. Moulton's *Novum Belgium* (1826) was the first American history to say that Manhattan had been bought from the Indians. This account, however, was completely fictitious, describing how small tracts were bought one at a time on lower Manhattan (Moulton 1826:427). It is difficult to discern what his sources may have been; a contemporary historian, George Folsom (1841:450), asserted that Moulton's only source was his own fertile imagination.

During the following two decades a number of histories of New York appeared, including Macauley's *The Natural, Statistical, and Civil History of the State of New-York* (1829), Eastman's *A History of the State of New York* (1832), Dunlap's *History of the New Netherlands, Province of New York and State of New York* (1839), Barber and Howe's *Historical Collections of the State of New York* (1842), and Watson's *Annals and Occurrences of New York City and State in Olden Time* (1846). None of them mention the purchase of Manhattan.

Only after Brodhead had returned from Amsterdam with the material from the Dutch archives that he had so tirelessly tracked down, was the purchase discussed again. O'Callaghan's *History of New Netherlands*, published in 1846, says: "The island of Mannhattans, estimated then to contain twenty-two thousand acres of land, was therefore purchased from the Indians, who received for that splendid tract the trifling sum of sixty guilders or twenty-four dollars" (O'Callaghan 1846, 1:104). His source was the Peter Schagen letter of 5 November 1626, which gives the purchase price only as "the value of 60 guilders."

At this point it is interesting to note how old the figure of twenty-four dollars is in regard to this purchase. Recent historians who have traced the historiography of the Manhattan purchase have suggested that the figure was first used by Anderson and Flick in 1902 or by Riker in 1881 (Weslager 1968:5; Zabriskie and Kenney 1977a:11). It is clearly much older than that.

During the next three decades the purchase of Manhattan Island for twenty-four dollars equaling sixty guilders is repeated by virtually every historian and textbook writer dealing with the history of New York. Among them were: Mather in *A Geographical History of the State of New York* (1848), Brodhead in *History of the State of New York* (1853), Valentine in *History of the City of New York* (1853), Vogelvangner in "The Manhattan Papers" which appeared in *The Sunday Times*⁴ (1859-1860), Booth in *History of the City of New York* (1867), Randall in *History of the*

State of New York (1870), and Stone in *History of New York City* (1872).

Randall appears to have been the first writer to have pointed out that the purchase would not have been made in coin. He suggested that trinkets and other goods would have been used instead (Randall 1870:19). With this there is no argument. The error that has been made was in trying to enumerate and identify, without any proof, the trading goods that were used, and presenting this identification as fact.

Beads were first brought into the picture in 1877 by Martha J. Lamb in her *History of the City of New York*. As far as can be determined by the present survey of historical works, this is the first attempt to list the actual goods exchanged for Manhattan, but the list is only a product of the author's imagination. She wrote: "He [Minuit] then called together some of the principal Indian chiefs, and offered beads, buttons, and other trinkets in exchange for their real estate. They accepted the terms with unfeigned delight, and the bargain was closed at once" (Lamb 1877, 1:53). Now the myth was complete. Peter Minuit stepped off the ship from Holland, called the Indians together, and for the paltry sum of twenty-four dollars worth of beads and assorted gew-gaws purchased the island of Manhattan, closing the "greatest real estate deal in history."

The story has been so often repeated and so widely illustrated, particularly by Alfred Frederick's painting, commissioned by the Title Guarantee and Trust Company, that it has become firmly rooted in American folklore. Nearly all laymen and most (although not all) professional historians have taken it for fact.

Some writers have been concerned about the equating of sixty guilders of the 1620s with the modern twenty-four dollars. O'Callaghan was clearly thinking of gold coin, and his estimate was par for his day. Others have not been happy with the figure. George W. Schuyler (1885:11, n. 1) estimated that in that year it was worth three hundred dollars. John Fiske (1899, 1:121) estimated its worth at one hundred and twenty dollars. Morison (1965:57) suggested a value of only forty dollars, apparently reflecting a bit more than an ounce of gold, now much elevated in price.

The most interesting calculation of the value of the purchase of Manhattan was made by John J. Anderson and Alexander C. Flick in *A Short History of the State of New York* (1901), when they reckoned that if the twenty-four dollars had been put at 6 percent compound interest it would be worth \$122,500,000 by the time they were writing. They must have calculated the amount from 1626 to 1891; by the time their book appeared in 1902 it would have been worth over 231 million dollars. In the same spirit, if we make a similar calculation from 1626 to 1986, we arrive at a figure of

nearly 31 billion dollars! Viewed in this way, the purchase of underdeveloped land was not too unfair, if only the Canarsie Indians had had access to a bank account.

James Wilson was so concerned about the price for Manhattan that in 1875 he asked the Queen of the Netherlands (Sophia) if she thought it had been unfair. Her Majesty's reply was that it had been perfectly fair because: "If the savages had received more for their land they would simply have drunk more fire-water. With sixty florins [guilders] they could not purchase sufficient to intoxicate each member of the tribe!" (Wilson 1892, 1:158). Her majesty obviously envisioned payment in coin and a neighborhood bar. Daniel Van Pelt thought her comments unamusing, not because of the racial slur, but because he believed the price equitable on other grounds:

But what were a few thousand acres of land to the Indians roaming over miles of it continually, compared with the glittering glory of utensils and trinkets and gaudy dress-stuff or blankets, to the value of more than four times \$24, as money counted in that day? It was an honest, honorable, transaction worthily inaugurating the trade and traffic of America's mercantile and financial capital; satisfying the instincts of justice and equality in the savage breast (Van Pelt 1898:19).

After all this, it seems a shame not to have the Indians' side of the story of first meeting the Dutch on Manhattan. Or do we? One of the most fascinating documents of early New York history was gathered by the Rev. John Heckewelder about 1760 from the elders of the tribes who once lived around New York harbor: The Indians said they saw a ship (apparently Hudson's *Half Moon*) approaching the island, and they dressed up believing it to be their spirit Mannitto. When the Dutch landed, they drank with the Indians and gave them "beads, axes, hoes, stockings &c" and said that they would return in a year and "should then want a little land of them to sow some seeds in order to raise herbs to put in their broth" (Collections of the New-York Historical Society 1841:69-74; Heckewelder 1876:71-75).

The next year (if this account is true, it would have been two years later when Hendrick Christiansen returned in 1611) the Dutch found that the Indians were wearing the hoes and axes around their necks like pendants and using the stockings for tobacco pouches. The Dutch put handles on the tools and showed the Indians how to use them and how to wear the stockings. "Here (they say) a general laughter ensued among them (the Indians) that they remained for so long a time ignorant of the use of so valuable implements; and had borne with the weight of such heavy metal hanging

to their necks for such a long time” (Heckewelder 1841:73). The Indians retained their good humor when the Dutch asked for land that a hide would cover or encompass, and then proceeded to cut a hide spirally into a long thin thong which enclosed a large plot of land when unrolled. The account ended with these words:

... these [the Dutch] asked from time to time more land of them; and proceeding higher up the Mahicanittuck (Hudson River), they believed they would soon want all their country, and which at this time was already the case (Heckewelder 1841:73).

All the tribal elders told Heckewelder a similar story, and one of them said that he had heard it from his grandfather fifty years before (Yates 1824:229). The account may therefore be only two or three generations removed from the actual events. Though some later historians have doubted the validity of this tale (Goodwin 1919:10; Hamilton 1959:23), pre-literate people are often surprisingly accurate when transmitting their own cultural history. The account may be more factual than has been assumed, and though it does not document the purchase of Manhattan, it does tell us how the Indians accounted for the Dutch gaining control of the island.

The tradition at least sounds authentic. The Indians could easily laugh at themselves for wearing the heavy tools as well as at the Dutch trick of getting a large plot of land with a single hide. The last sentence of the account (the Dutch “asked from time to time...”) even sounds as though it had been added clause by clause as the newcomers came to dominate an increasing amount of land. In any case, it certainly demonstrates the native love for beads and other sorts of personal adornments, and it sets the stage for later developments.

CONCLUSION

It is difficult to judge the authenticity of the story Heckewelder reported. Nonetheless, it is at least as good as the old myth we others have long believed about a wily Dutchman buying the heart of America’s greatest city for a couple of handfuls of beads worth a few dollars.

ENDNOTES

1. Editor’s note: This article was first published in *New York History: Quarterly Journal of the New York State Historical Association* in 1986. It was subsequently awarded the Kerr History Prize as the best article

published in *New York History* that year. As it attracted particular interest from the public, it was reprinted in the journal in 1997. Despite this, Peter’s article and the facts it contains are still not generally known. It is, therefore, being reprinted here once again. Thanks are extended to *New York History* for permitting this.

The text remains unchanged but the format has been altered to conform to that of *Beads*. Section headings were added and footnotes were converted to either endnotes or to references cited with full bibliographic information being included. Not all the illustrations could be included, particularly Alfred Frederick’s famous painting of the purchase of Manhattan Island, but those that are provide a good representation of what was in the original article.

2. Plowden’s *New Albion* (1632) says, “The trade for hatchets, knives, and nails, beads and toys, which the savages [take] for their beavers, here worth 1 £ 2s a weight, and otters’ and deer skin, and for their maize wheat is worth ten for one by way of truck” (Bunce and Harmond 1977:7).
3. Credit is commonly given to Sir William Johnson for bringing to the attention of Europeans the value of wampum among the Indians, especially the Iroquois. In a letter to DeWitt Clinton, the governor of New York, on 26 March 1753 he said, “... it is obvious to all who are the least acquainted with Indian Affairs, that they regard no Message or Invitation be it of what consequence or nature it will, unless attended or confirmed by a String or Belt of Wampum, which they look upon as we do our Letters, or rather Books” (O’Callaghan 1851, 2:624).
4. *The Sunday Times* of London? Bound copy in the New York State Library, Albany.

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VENETIAN GLASS BEADS AND THE SLAVE TRADE FROM LIVERPOOL, 1750-1800

Saul Guerrero

The competition within the slave trade during the 18th century forced slave traders to search for an assortment of barter cargo that would attract the preferential attention of the African suppliers of slaves. An enterprising group of Liverpool slave traders that formed William Davenport & Co. rose to the occasion and in three years became the supplier of half of all the glass beads re-exported to Africa from England. An analysis of barter values in Bonny, West Africa, reveals that glass beads were one of the main categories of trade goods of great interest to the African slave traders. The trade beads were primarily the products of Venice where the glass bead sector grew from at least 7% to over 70% in value of total Venetian glass exports from the late 16th to the late 18th century. While the sale of glassware in Venice slumped due to competition from other European producers, the bead industry prospered and manufactured tens of millions of units of conterie and perle a lume beads per year during the second half of the 18th century.

PART ONE: THE TRADERS

“Many have been the approaches that... our Resident has made to the British Court with the purpose of introducing a direct trade of glass beads... to the British Nation”¹ (Querini 1767:32v). Thus begins a report by Paolo Querini, one of the *Inquisitori alle Arti* appointed to oversee the various guilds of artisans and artists in Venice (Cecchetti 1866:342), sent to the attention of the *Serenissimo Principe* of the Republic of Venice on 26 September 1767, with respect to the activity of the Venetian Resident in London, Count de Vignola. “Vignola... proposes to his Excellency a trade with the Company of Liverpool... of glass beads from Venice, word that in English covers not only what we call in Venice *contarie* but also the manufacture of *suppialume* [*perle a lume*]”² (Querini 1767:36r).

Around this same time, Sir James Wright, His Majesty’s Minister in Venice, in “a very secret and difficult manner,” obtained copies of the reports being sent by Vignola to the *V Savi alla Mercanzia* (The Five Wise Men of Trade) in Venice regarding the glass bead trade to Liverpool (The

National Archives: Public Record Office [TNA: PRO] SP 99/73:19r). The Senate of Venice delegated to the Venetian Board of Trade, the *V Savi* or *Cinque Savi*, the care of all matters relating to the trade of the Republic (Da Mosto 1937:196-197). To one of these copies Wright would add: “It seems our African Trade always suffers whenever we are not regularly supply’d with Beads: it is very certain that the indolence of the Venetians together with the number of their feast days prevent them from supplying us with the necessary quantity” (TNA: PRO SP 99/73:19v, 108v). A set of reports concerning the bead trade, among other things, was sent via confidential channels to the Secretary of State of the Southern Department, the Third Viscount Weymouth, and then to Lord Hillsborough, Secretary of State to the Colonies (TNA: PRO SP 99/73:19r).

Why was the trade in Venetian glass beads of such importance that it was reported in detail to the highest levels of authority in both the Republic of Venice and in England during the last half of the 18th century? To provide the answer, this study is divided into two parts since glass beads reflect the desire of England to optimize profits from the African slave trade on the one hand and the strategic need of the Venetian Republic to foster one of its remaining sectors of competitive glass exports on the other.

The Liverpool traders are represented by four individuals whose trading activity is well documented: William Davenport, William Earle, Thomas Earle, and Thomas Hodgson. Together with three other partners, they registered the firm of William Davenport & Co. (hereafter WD&Co.) in Liverpool in 1766, to provide glass beads and similar goods for the African trade. By analyzing the sales of WD&Co. within the context of total bead re-exports to Africa from England, it is possible to show that for a time, WD&Co. was the dominant bead trading house in England. Evidence also identifies WD&Co. as the “Liverpool Company” that attracted the urgent attention of the authorities of the Venetian State and elicited the subsequent covert reports from the English Minister in Venice. Glass beads were a

significant component of the barter goods shipped by the Davenport slave ventures to Africa. An analysis of the trading accounts of these African slave ventures reveals that glass beads were a manufactured trading good quite distinct from the notion of a cheap trinket with a barter value totally out of proportion to its cost for the European trader.

The producer in the second part of this article is represented by Murano and Venice, being pioneers in the technology and production of glass beads in Europe. Their entry into the Liverpool market proved that Venetian glass beads were able to compete against other bead-producing centers in Europe and avoided the fate of other Venetian glass exports of the period such as luxury transparent glass and large mirrors. A combination of technical expertise and experience coupled to mass production placed the Venetian bead industry in such a strong position in international markets that it became the leading glass export category of Venice during the second half of the 18th century (Trivellato 2006:143-183).

Following the period of disruption caused by the American War of Independence, the re-export of beads from England to Africa did not regain its pre-1780 levels and thus the demands of the English market for Venetian beads decreased substantially. The heady days of William Davenport & Co., “Merchants of Liverpool, for carrying on the trade of selling Beads, Arangoes, Cowries, Corral or any other article, probably for the African Trade,” were now over (Earle Papers [EP] D/EARLE/4/2).

Glass Beads and the Slave Trade from Liverpool, 1750-1800

Between 1751 and 1800, approximately one million slaves were traded by ships outfitted in Liverpool (Trans-Atlantic Slave Trade Database [TSTD]). During the early part of this period, there is no evidence of any special interest in glass beads in Davenport’s trading activities. The entries for sales in the surviving Waste Book begin in 1747, while the first entry for the sale of glass beads only appears in April of 1761. The amounts throughout are modest and in many cases Davenport is simply earning a commission on beads supplied by a third party such as Robert and Elizabeth Vigne of London, the firm of William and James Manson & Co., or through a “Bead Account” on the Isle of Man. Annual amounts between 1747 and the last entry in June of 1766 went from less than £5 per year through an unremarkable increase during 19 years of business to over £200 a year. On this evidence, it would be very hard to predict that in two years time Davenport would be part of a major international glass-bead business with annual sales around £10,000 that

would attract the interest of the *Serenissimo Principe* of the Republic of Venice. The first indication of the new expansion in the trading horizon of Davenport is in one of the last entries of the Waste Book which reads “Bead Account in Company with Will. Earle & Co.” and “To Earle & Hodgson for 1/6 part of Beads” (Davenport Waste Book).

Other actors were now playing a decisive role in this new direction of Davenport’s trading career. Enter first the Isle of Man. Situated conveniently close to the shipping lanes out of Liverpool, it profited from a duty-free status on goods loaded from its port. It played a major role in the provision of duty-free European cargoes (including glass beads) ordered through retailers such as Vigne & Co. that were loaded onto slave ships bound for the African coast sailing from Liverpool. In 1765, however, the nature of the trade with the Isle of Man changed substantially when the tax-free status came to an end (Morgan 2007:21-22). The opportunity thus presented itself for the entry of a new and more reliable source of glass beads from Europe with a similar fiscal incentive as the Isle of Man had provided until then. As will be seen, the combined efforts of WD&Co. and Count de Vignola provided such an option.

The Earles and the Italian Connection

Of the partners who signed the articles of agreement for WD&Co. on 24 July 1766 (William Davenport, Peter Holme, Thomas Hodgson, Ralph Earle, Thomas Earle, William Earle, and John Copeland), one family name and its inner circle stands out as bringing to the business a longstanding commercial relationship with Italy; i.e., the Earles, together with Thomas Hodgson, their business partner in Leghorn, and John Copeland, a brother-in-law. Thomas Earle and Thomas Hodgson brought to WD&Co. the unique opportunity to import directly from Italy the glass beads manufactured in Venice, using their established channels of trade and freight between Leghorn and Liverpool.

The younger Earle brother William, four years older than William Davenport, had gained very valuable trading and bartering experience as captain of a slave-trading vessel (Pope 2007:198). Part of his trading correspondence has survived and provides valuable insight into the obstacles faced by slave traders putting together cargoes via the Isle of Man. One series of letters begins with an order for a specific set of beads placed on 22 August 1760 with Peter Abraham Luard, his bead supplier in London. One month and much frustration later, the sense of urgency created by the lack of just 250 bunches of beads (called “pipes” in his letters) for his cargo is evident in the following letter [*italics added for emphasis*]: “I am surpris’d the goods you had already

packed did not come out... if you cannot buy or borrow 150 Bs [bunches] of purple pipe... also 100 dark dove pipe... we must be content to go without them... *but for the want of them for assortment may ruin a voyage*" (EP D/EARLE/2/2). The potentially ruinous consequences for this slave voyage in not loading at the most some 500 kg of beads, representing less than 0.5% of a minimum average cargo weight (100 tons) for a slave venture, is a telling indication of the importance given to beads as barter cargo. The need for beads could even justify a further provisioning at the Isle of Man. On 23 November 1764, William Davenport instructed the captain of the *William* to stop at the Isle of Man to pick up "a parcell of Beads... [and then] make all the Dispatch from thence... [to] the River Gambia." In fact, the *William* was already carrying £232 in beads and the parcel would add another £58 in cargo value so, that for this particular voyage, beads represented 18% of total cargo value (Davenport Accounts).

The Marketing Success of William Davenport & Co.

To better judge the change in the business paradigm that WD&Co. brought about in England for a short time in the marketing of glass beads for re-export to Africa, it is necessary to place it in the context of other sources of glass beads for the slave traders of Liverpool during the second half of the 18th century. The traditional retail channel for beads is exemplified by the Vigne family which carried out business during the whole of the period in question. Thus, on 1 June 1765, Robert Vigne sent a letter to the Treasury requesting a licence to import a "parcel of bugle [tubular glass beads]" that had been caught up in the change of the tax status of the Isle of Man (TNA: PRO T 1/451/143-144). Forty-one years later, on 15 January 1796, the cargo manifest for the vessel *Armonia* that arrived in the Port of London from Venice listed a shipment of "five barrels of *conterie* beads" and "three chests of *perle a lume* beads" for the attention of "Robert Vigne, an English subject"³ (Cinque Savi Consoli). Retailers such as the Vignes would obtain their beads in Europe and supply them to clients in England. Other similar intermediaries that figure in the supply of glass beads for slave-trading ships sailing from Liverpool were Peter Abraham Luard (EP D/EARLE/2/2), the Mansons (TNA: PRO PROB 11/931 and PROB 11/1176), and the Fonseca brothers (Dumbell MS-10-50 [1-2] and MS-10-51). Beads were not necessarily the only stock of these middlemen supplying the slave trade. As the trade with Venice grew, there is evidence that at least one Venetian bead manufacturer tried to establish direct trade with the slave traders of Liverpool (Inikori 1973:124).

WD&Co. represents a complete break from the approaches outlined above and arguably had no equal in the

glass-bead trade in England during this period. First of all, the majority of its partners were active slave traders, thus bringing to the glass-bead business their practical knowledge regarding the best choice of beads for barter in Africa and their prior experience in the outfitting of slave ships. They also set an example for their peers in Liverpool regarding the successful use of beads in the assortment of cargoes bound for Africa, as can be observed from the listing of their major bead clients in the Davenport Bead Book: William James, William Boates, Robert Green, Chris Hasell, Miles Barber, and Samuel Shaw among others, all among the major slave traders of Liverpool (Morgan 2007:14-42). In addition, they were able to use their business connections in Italy to profit from the interest shown by Venice in becoming their supplier of beads. Without having to invest capital in new fixed overheads, they could use their existing export/retail infrastructure and freight arrangements between Italy and Liverpool to quickly incorporate glass beads into their marketing activity. These major advantages would help to quickly set them apart from the traditional bead suppliers plying the slave-trade business.

Where did WD&Co. obtain its beads? Vignola had managed to obtain permission from the English Parliament to warehouse Venetian beads destined for re-export for up to five years without having to pay any duty. He tied this very important concession to the fact that now "the Dutch cannot sell second-hand and contraband [beads] to England" and to the formation of "a rich company of merchants in Liverpool" who, from the start, had been building a direct trade with Venice as a source of glass beads "for a useful trade with Africa" (TNA: PRO SP 99/73:111r).⁴ This "Liverpool company" can be identified as the WD&Co., as revealed in Vignola's letters. In one, he invited Mr. Copeland of the "Liverpool Company" to come to London to observe the quality of Venetian beads. He quotes from a letter received from Mr. Hodgson, "Director of the Company," where "the Director avows that the [Venetian beads] are not only well made but superior to [the beads] made in Bohemia"⁵ (TNA: PRO SP 99/73:112r).

Vignola then emphasized the need to match prices in order to dominate this market: "it is true that if Venice... finds a way to [offer the same prices as] the products of Bohemia... it will attract in the future all the orders from London, Liverpool and Bristol"⁶ (TNA: PRO SP 99/73:113r). Vignola wrapped up his account of a successful trade promotion by informing the *V Savi* that the Liverpool Company will order a substantial quantity of beads, paying 5% more than what they paid for Bohemian beads. The reasons for the premium may lie in a previous letter where Vignola mentioned that the Liverpool Company was requesting 18 months credit on bead purchases (TNA: PRO SP 99/73:45v).

On 28 June 1768, Thomas Hodgson wrote to Vignola to explain the obstacles to shipping from Nuremberg due to local problems with the Rhine princes and the King of Prussia, so this was an opportune time for Venice to provide an alternate supply source. He proposed sending a 120-ton ship to Venice to load a cargo of beads as a first step in establishing a direct trade with Venice (TNA: PRO SP 99/73:101r-102v, 105r-106v). The Vignola papers thus reveal that WD&Co. did not purchase beads directly from Venice to any great extent until 1768, Bohemia apparently being the main supplier, though this does not rule out an indirect supply of Venetian beads prior to this date.

No further archival documentation concerning the supply of Venetian beads to WD&Co. after mid-1768 has been encountered. The level of bead sales between 1768 and 1770 indicates that WD&Co. had not only solved the problems of supply via the Rhine but that it was able to substantially increase the amount of beads being supplied to the English market and at the right price to maintain market growth. While it is not certain whether Venice managed to capture *tutte le commissioni* as predicted by Vignola, there is no reason to doubt that Venice achieved its purpose of establishing a direct supply of beads to the English market via WD&Co.

To measure the market impact of WD&Co., Table 1 compares company sales as registered from mid-1766 to early 1770 (Davenport Bead Book) with the re-export of glass beads from England to Africa during the same period (Johnson 1990:78-80). By 1769, WD&Co. held 48% of the

market, a remarkable feat for a new supplier that had only come into existence in mid-1766. The traditional bead traders would probably have held on to at least their historic level at approximately 20% of the market, which corresponds to the £5,000 baseline in re-export sales observed from the 1720s to the 1760s (Figure 1). Even if there had been a single additional trading house along the lines of WD&Co., the remaining market share would have been 30% at most. It seems more probable that the market was divided equally between WD&Co. on the one side and all the other glass bead traders on the other.

Prior to WD&Co., the growth in the English slave trade between 1745 and 1766 did not see a correlated expansion in bead re-export activity. In mathematical terms, the linear coefficient of correlation between the data relating to the slave trade and the total re-export of beads to Africa was 0.02 during the period 1721-1751, 0.47 during 1751-1765, 0.85 during 1766-1783, and -0.11 during 1784-1795. This confirms that the only clear correlation between slave trade activity and the value of bead exports corresponds to the period between the entry of WD&Co. into the market in 1766 and the crash of 1780. WD&Co. fostered a new level of demand by offering a local and ample supply of beads as evidenced by the entries in the Davenport Bead Book, which coincided with the increase in the slave trade from Liverpool. It is further argued that WD&Co. responded quickly to market constraints in supply by profiting from the desire of Venice to become a supplier to the English market.

Table 1. Market Share of WD&Co., 1767-1770.

Period	Sales WD&Co.	Bead Exports to Africa	WD&Co. Market Share of Bead Re-exports to Africa
	£		%
July to December 1766	942	n/a	n/a
1767	5,504	20,747	27
1768	9,022	24,614	37
1769	12,417	25,690	48
January to July 1770	8,710	n/a	n/a
1770 (projection)	< 14,900	19,338	< 58
Note: 1770 would register a sharp decline in exports, so a projection based on mid-year results may overestimate the total annual sales. In 1770, sales in seven months reached the level of the total sales of 1768.			
Sources: Davenport Bead Book; Johnson 1990:78-80.			

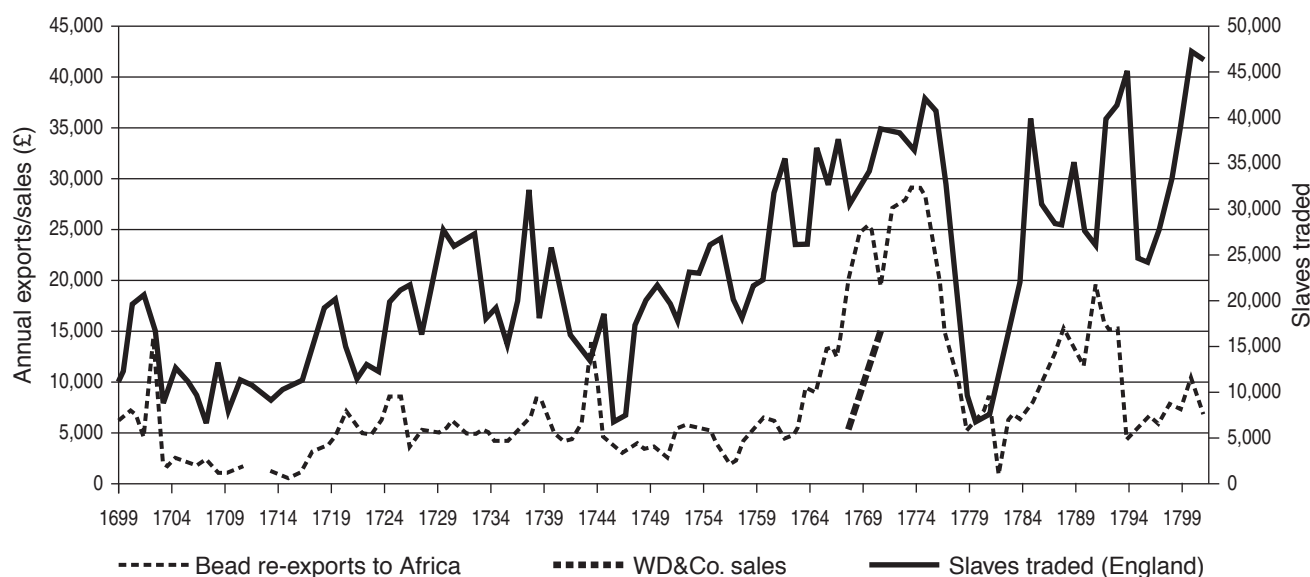


Figure 1. Historic trends of slaves traded on English ships and the concurrent bead re-export market (Davenport Papers, Bead Book; Johnson 1990:78-80; TSTD).

What happened after the crash of 1780 that significantly reduced the size of the bead market in England? After 1773, WD&Co. is no longer identified as the supplier of beads in the Davenport invoice books for the slaving voyages, its place being taken by Copeland & Co. The last annotation in the Bead Book in July of 1770 reads in part: “the new Sales Book... was delivered to John Copland,” which may indicate a new distribution of responsibilities among the associates (Davenport Bead Book). No register of dissolution has been found for WD&Co. and the disappearance of Davenport from the company name after 1773 remains an open question. The period after 1780 also corresponds to the passing of the Earle generation that had created the unique bead-trading house. Thomas Earle died in Leghorn in 1781, followed by William Earle in 1788.⁷ The bead market in England would never regain the dynamic it possessed following the creation of WD&Co.

The Supply of Beads from Venice

To establish a reliable supply of beads from Venice to Liverpool, Venice had to be able to satisfy the potential demands of the English market at a price that would allow the beads to compete with other trade goods. England imported the majority of the glass beads used in the barter trade with Africa (Johnson 1990:58). Venice was not the only supplier and was competing with Bohemia, if not other sources. One way to establish an order-of-magnitude correlation between

the demands of the English market and the export potential of Venetian glass beads is to compare the value of re-exports from England to Africa and the sales of WD&Co. with the total value of Venetian bead exports to Western Europe as registered with the Venetian customs authorities converted to pounds sterling (Trivellato 2000: 230-231).

In order to compare these data in a single graph, an exchange rate of 5 Venetian Ducats to the pound sterling has been utilized even though it corresponds to the rate calculated by Rapp for 1650 (Rapp 1976:136). Additionally, the cost of freight between Venice and the ports in England has been ignored. Both assumptions can be optimized but they are useful approximations to arrive at a general overview of the supply capability of Venetian bead producers in respect to the demands of the English re-export market.

Prior to 1780, the English bead market represented approximately 50% of the value of the bead exports from Venice to Western Europe (Figure 2). The other customers included France, Portugal, Spain, and Holland. Since Vignola actively courted the English market, the suggestion is that Venice was not exporting enough beads to England, or to other destinations, to the limit of its production capacity prior to 1767. After 1780, the English market for beads declined, which may explain the disappearance of WD&Co. As of that date, Venice and Liverpool/England went their separate ways, the former maintaining a variable level of glass bead exports to Western Europe as its lowest range surpassed the needs of the English market.

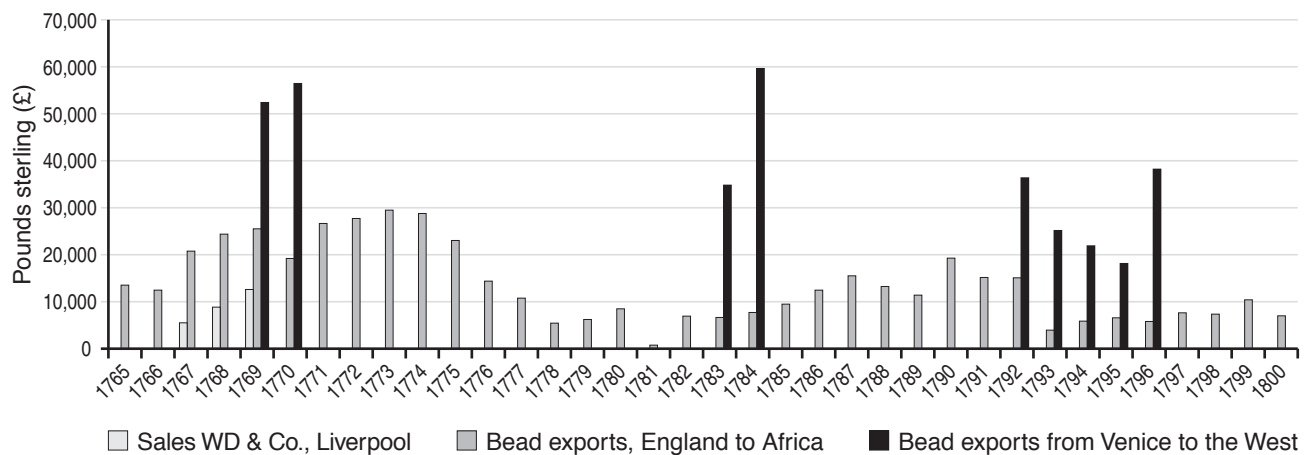


Figure 2. English demand and the Venetian supply of glass beads (the West includes England, Spain, France, and Holland)(Davenport Papers, Bead Book; Johnson 1990:78-80; after Trivellato 2000:230-231).

The WD&Co. Pricing Policy for Glass Beads

The pricing of glass beads in the English market determined if they could generate the required level of profit to become a major category of barter goods for trade with Africa. This is not a condition that can be taken for granted, since the glass recipes for beads were the most expensive of Murano, and the labor required during the manufacturing process was intensive.

Table 2 compares the values for pricing Venetian glass beads during the second half of the 18th century that are relevant to the present discussion. The information is derived from the following sources: a) a letter dated 1782 from Giovanni Cimei, trader of Loreto (Italy), to Girolamo Rossetti, a glassmaker on Murano requesting a shipment of various types of *conterie* at specified prices (Inquisitori di Stato); b) the accounts of the individual slave voyages kept by William Davenport that register the prices by weight

of the beads in the cargo (Davenport Accounts); and c) an original in English and an accompanying translation into Venetian Italian of an offering of “Coloured Glass Beads, 6 Boxes, in Time, in 6 Lots, at 2s. per lb.” in London in 1782 (Inquisitori di Stato).

The letter from Loreto is a very useful guide to the determination of value in the marketing of beads in Italy. *Conterie* were sold wholesale at 14 *soldi a libbre sottili* to a trader in Loreto who then set an obligatory minimum retail price to the public of 24 *soldi a libbre sottili*, below which the shopkeepers in Loreto were not allowed to sell.⁸ Assuming a similar mark-up was applied further on, this would suggest a FOB cost in Venice of around 8 *soldi per libbre sottili* minus distribution costs to Loreto.

In Liverpool the price recorded for the beads loaded as cargo on the Davenport slavers was on the order of 9 pence a pound (equivalent to a *libbre grosso*).⁹ This included

Table 2. Prices of Venetian Beads, 18th Century.

Market	Period	Price in <i>Soldi</i>	Unit of Weight	Type of Bead
Loreto wholesale	1782	14	<i>libbre sottili</i>	<i>conterie</i>
Loreto retail		24		
WD&Co. FOB Liverpool (1)	1768 – 1782	15 23	<i>libbre sottili</i> <i>libbre grossi</i>	<i>perle a lume</i> and <i>conterie</i>
Other Retail London (2)	1786	39 62	<i>libbre sottili</i> <i>libbre grossi</i>	not specified
Notes: (1) Based on 9 pence a pound; (2) based on 2 shillings a pound.				
Sources: Loreto and London prices from Inquisitori di Stato; WD&Co. price from Davenport Accounts.				

freight from Venice, the cost of warehousing in Liverpool, and the profit margin of WD&Co. This price corresponded approximately to 23 *soldi a libbre grosso* or 15 *soldi a libbre sottili*, based on a currency exchange rate of 5 Venetian ducats to one pound sterling (Rapp 1976 :136). Beads in Liverpool up to the early 1780s were thus sold retail at just over the wholesale prices in Loreto in 1782. This suggests a very aggressive marketing policy of WD&Co. that aimed at market share rather than unit profit. That WD&Co. could adopt this marketing strategy is a reflection of their control of business costs and of their purchasing power.

If the London bead prices of 1782 shown in Table 2 are in any way indicative of how bead prices evolved in England after 1780—with glass beads being offered at 2 shillings per pound instead of the 9 pence offered previously by WD&Co.—the increase in price (nearly 170%) would have significantly lowered the gross mark-up that a slave trader could expect from beads as barter cargo. In order to better understand the economic impact of WD&Co.'s pricing strategy, the following sections will address the economic factors regarding the use of glass beads in the Liverpool slave trade.

Glass Beads in the Trade Cargo of Liverpool Slavers

Why were glass beads of such interest as a barter cargo for the English slave trade? The historiography of the slave trade is ambiguous in attaching any importance to glass beads (Thomas 1997:313-329). In contrast, the empirical evidence leads to the following conclusion: “The main categories of goods in demand were as follows: cloth and beads, iron bars, brass rods and brass bowls, alcohol and tobacco, guns and gunpowder... a considerable number of beads was generally included in the cargo” (Johnson 1976:15-21). Johnson (1990:54-63) published statistics that show that bead re-exports from England to Africa in the 18th century reached a total of £0.8 million, a sum on the order of magnitude of copper and brass (£1.4 million), gunpowder (£1.5 million), and iron and steel (£2.3 million). In Richardson's (1979:303-330) breakdown of the 8 categories of barter goods for the African slave trade based on a detailed analysis of over 90 slave-trading accounts, glass beads figure prominently. His data confirm that textiles were always the principal trading good offered to Africa. Data published by Davies (1960:350-357) and Richardson (1979:312-315) reveal that their share of total cargo value of exports to Africa dropped by some 40% from the time of the Royal Africa Company to the slave trade from Liverpool, as evidenced in Table 3. Beads and other barter cargo increased their importance as exports from Liverpool at the expense of textiles. The export value of glass beads was, on average, greater or equal to that

of gunpowder, cowries and spirits, arms and iron, and only brassware and textiles showed a greater presence.

Credit terms were not the same across the range of barter goods according to the Davenport accounts. Spirits and cowries were purchased mostly on cash terms (only about 5% of their total value was sent on credit to Africa). Beads and arms were also for the most part bought on cash terms (only around 12% was sent on credit), while iron and brassware were purchased on a combination of cash and credit. In contrast, textiles and gunpowder were items mostly shipped on credit (Table 4). It is a measure of the market strength of merchandise such as beads when it could command cash terms in the face of competition from other products being offered on credit.

The Profit from Glass Beads in West Africa

As a rule, slaves were bartered for a basket of goods on “the principle of Assortment, according to which the cheap goods were acceptable only if accompanied by more expensive goods” (Johnson 1966:202). A balance was struck between the imposition by the trader of certain kinds of goods and the reticence of the African slave trader to accept them unless compensated with the goods he actually preferred. This bargaining was played out in the face of strong competition between European slave traders: “Dec 1st 1769... anchored in Whydah... where were 5 portuguese & 2 French vessels” (EP D/EARLE/1/4). Whatever could give the slaver an edge in a barter market would result in a faster turn-around time for him and lower the risk of insurrection, attack, and disease as well as increase the overall profits of the venture by decreasing running costs and the timing of the overall cash-flow cycle.

The historiography concerning the profit from beads in Africa includes reports such as “For Europeans, whose aim was to maintain maximum profits with a minimum commitment of manpower and resources, glass beads, exchanged for... African... slaves... yielded enormous margins—1,000 per cent was the return on investment according to a source in 1632” (Dubin 2006:106). In 1723, Savary de Brulons reportedly claimed that one slave could be bought with 2 kg of beads, approximately the weight of one bunch (Trivellato 1998:69-70). Even at the high price of two shillings a pound for beads (around nine shillings a bunch), this would be a four-digit percentage range of gross mark-up for any barter value of a slave over £5. Is there any substance to the notion that glass trade beads were a cheap cargo that was grossly overvalued during barter in Africa?

In order to proceed further on the matter of profit from the barter trade in beads, it is necessary to define how

Table 3. Value Share (%) of Main Slave-trading Cargoes.

	Beads	Iron	Brassware	Textiles	Gunpowder	Arms	Cowries	Spirits	Other	Total
RAC	2.1	7.3	6.3	47.2	2.9	3.4	6.4	(1)	24.4	100
L	7.7	7.7	14.3	27.9	5.4	6.5	7.1	5.2	18.3	100

Notes: RAC is the percentage of cargo values exported by the Royal African Company averaged over the periods 1674-1676, 1680-1685, 1688-1698, and 1701-1704. (1) the data for spirits are included under "Other." L is the percentage of cargo value as reported in available records from Liverpool slavers averaged over the period 1755-1800.

Sources: RAC adapted from Davies 1960:350-357; L from Richardson 1979:312-315.

Table 4. The Role of Cash and Credit, Davenport Ventures, 1761-1783.

	Beads	Iron	Brassware	Textiles	Gunpowder	Arms	Cowries	Spirits	Other	Total
% Disbursement	14	17	4	4	< 1	14	9	17	21	100
% Notes	12	28	48	85	80	11	4	5	48	n/a
% Total Value Cargo	8	10	17	28	5	5	7	6	14	100

Notes: % disbursement is the percentage of cash outlay per category of goods with respect to total cash outlay on goods: this provides an indication of the perceived opportunity cost of each category of goods to the slave trader; % notes is the percentage of credit extended to a particular category of goods with respect to the total expenditure in that category: this provides the debt to equity ratios (financial leverage) for each type of goods; % total value cargo is the percentage breakdown of total value for each category of barter goods over total cost (cash plus credit) of barter goods, used as a crosscheck with published data (L in Table 3 above).

Source: Davenport Accounts, average of 61 slave trading ventures.

this profit was estimated. To begin with, the overall net accounting profit from the Davenport ventures has been proposed by Richardson (1976:62) at around 8%. Since beads represented on average 8% of total cargo value, these two values by themselves contradict any claim to a four-figure net accounting profit from the barter of glass beads.

It can be argued that the high-percentage profits reported in the historiography of glass beads were not calculated from a detailed accounting of total revenues and expenses but represent a trader's rule-of-thumb estimation of the gross mark-up between the prime cost of barter goods (such as glass beads) and the final revenue from the sale of slaves. This gross mark-up does not include the cost of the voyage, economies of scale with regard to ship sizes, the practice of over-invoicing, nor the impact of using credit to potentially aim at a higher profit on every cash amount expended (by financial leverage) on certain goods. It treats all goods as having a similar barter value in Africa, which was not the case. The index, with all its drawbacks, at least identifies a ceiling for the range of profits a slave trader could obtain on his assortment of barter cargo. Figure 3

shows the distribution of mark-up percentages for each of the 51 Davenport slave ventures where there was sufficient data to calculate the index.¹⁰ On average the mark-up was 162% and it can be seen that few of these voyages managed to reach values over 400%.

It can be argued that this conception of a gross mark-up does not reflect the fact that barter goods had a barter value in Africa that was independent of their prime cost in Liverpool. Thus beads may have been sufficiently overvalued in Africa compared to all other bartered goods so as to reach four-figure mark-up values. Goods in Africa were traded according to local systems of valuation at the point of barter; e.g., the ounce and the bar, among others (Johnson 1966:197-214; Law 1991:239-257). Unfortunately most of the slave trade account books researched for this article (around 80) only included the prime cost of the merchandise for barter and the final value of sales of slaves, ivory, or palm oil in pounds sterling. To date, only two account books of Liverpool slaving ventures during the period of interest have been found that include the prime cost, the barter value expressed in bars at the destination in Africa, and the value

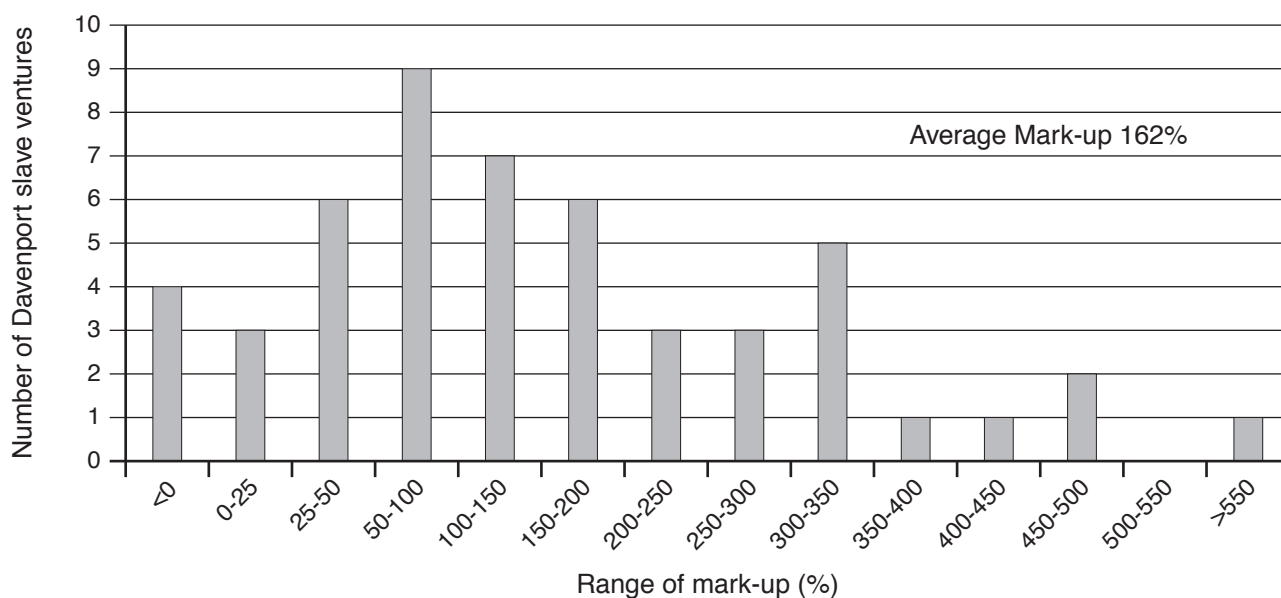


Figure 3. Mark-up on total barter goods of 51 Davenport slave ventures, 1761-1783 (Davenport Papers).

of slaves sold in the New World. These accounts relate to two voyages of the slave ship *Earl of Liverpool* to Bonny, West Africa, in 1797 and 1798 (Dumbell MS-10-50 [1-2]).

Based on these accounts, Figure 4 compares the percentage share of total cargo value based on the prime

cost of the main barter cargoes compared to the same share calculated on the basis of the barter value (expressed in bars) in Bonny.¹¹ Gunpowder is the cargo category that increases the most in relative value on arrival, with beads a strong second. Firearms keep their valuation at destination. Textiles

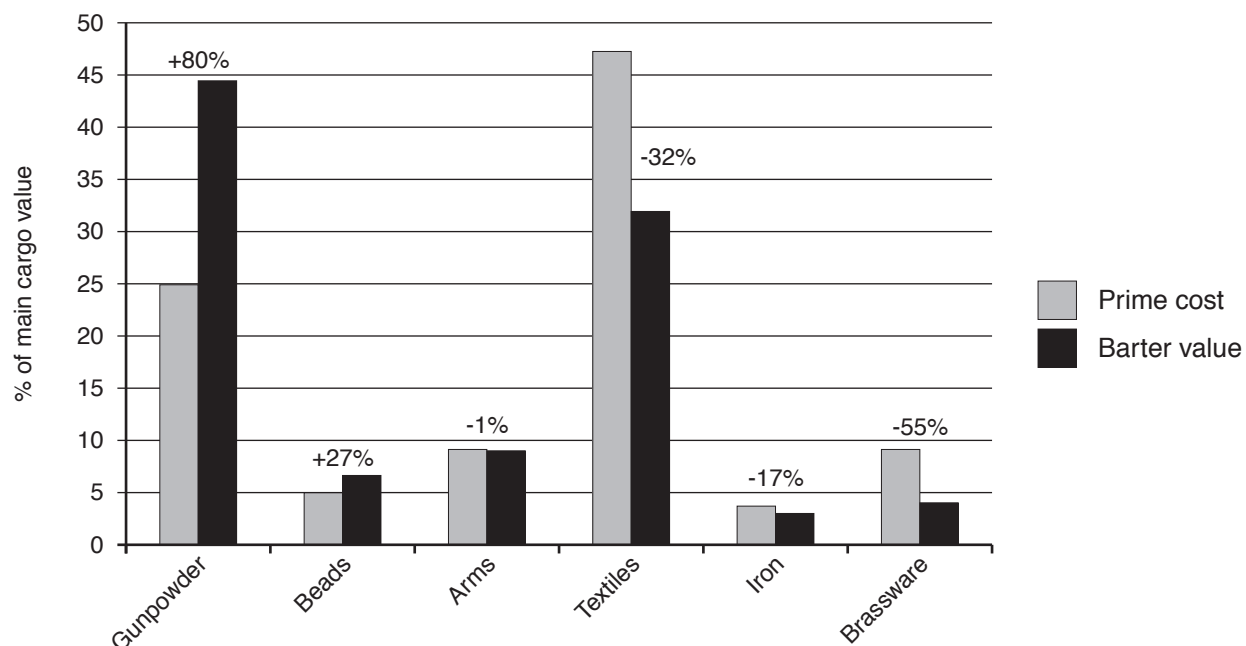


Figure 4. Change in relative values of slave-trading cargoes at Bonny, West Africa; *Earl of Liverpool*, voyages of 1797 and 1798 (Dumbell MS-10-50 [1-2]).

lose one third of their value relative to the other goods. Iron and brassware lose one sixth and one half, respectively, of their relative value at origin.¹² If the comparison is now made as to how many bars at Bonny could be bartered for every pound sterling of prime cost of the different cargo categories (Figure 5), it becomes clear that beads constituted a very attractive component of the export cargo on these two voyages, second only to gunpowder. For a slave trader looking to enhance the barter value of every pound sterling spent in Liverpool, glass beads were certainly one of the best choices according to these data.

For at least these two voyages, it is now possible to determine the order of magnitude of the gross mark-up for glass beads and other individual barter goods based on the actual barter value in Africa. Each category of cargo is assigned its deemed contribution to total revenues for sales of slaves in the New World in proportion to their share of total barter value expressed in bars, as shown in Table 5. This allows a calculation of mark-up based on barter value at Bonny, not on prime cost in Liverpool. In figures rounded off to the nearest ten, Table 5 shows that gunpowder (830%), beads (560%), and arms (420%) achieved the highest gross mark-up, while textiles (250%) and brassware (140%) achieved the lowest. The average mark-up for the two voyages is 420%, thus placing it above the average indicated in Figure 3. Barter trade is location specific and the records from two voyages cannot be taken as representative of the whole bead-trading business in Africa during the 18th century. The figures in Table 5, together with all the other facts regarding net and gross profit levels of the African slave trade, do, however, point out the need for caution when

interpreting statements in the historiography that imply unique four-digit profit levels for just glass trade beads.

For the *Earl of Liverpool* ventures, gunpowder generated much greater profits than glass beads and probably only safety concerns imposed a ceiling on the amount taken on board for each voyage. Textiles on credit, rather than beads bought on cash terms, would have surpassed a 2,000% gross margin of leveraged profit for the two voyages. The greatest advantage that can be claimed for beads on the basis of the available data is that—according to Table 5—beads could command a premium on barter of around 30% over the prime cost. Given that the Davenport voyages present an average mark-up of 162% and if Bonny is representative of the barter value of beads throughout West Africa during the second half of the 18th century, then the mark-up on beads would not have exceeded 200% on average for a slave trader such as Davenport and associates.

Would a rise in the prices of beads have influenced the decline in the bead re-export trade after 1780? Based on the available data, the price elasticity of the beads used in the slave trade cannot be calculated. It is, however, possible to state that if prices had increased after 1780 (e.g., from the 9 pence per pound in the Davenport accounts to 2 shillings or more per pound), they would have impacted significantly on a gross profit that was not much greater than that of any other barter good according to the Davenport accounts. In other words, beads were not overvalued goods at barter that could have withstood significant price increases in Europe. Glass beads were a type of item that the Africans could relate to culturally, which is why beads were so useful in making an assortment of goods more appealing at barter.



Figure 5. Average barter value in bars at Bonny per pound sterling of prime cost, *Earl of Liverpool*, voyages of 1797 and 1798 (Dumbell MS-10-50 [1-2]).

Table 5. Estimates of Gross Mark-up of Main Barter Goods, *Earl of Liverpool*, 1797/1798.

	Prime Cost	Barter Value	Value Share Based on Bars	Revenues From Slave Sales Pro- rated to Bar Values	Gross Mark-up Based on Bar Value
	£	Bars	%	£	%
Beads	250	2,299	6.8	1,649	560
Textiles	2,231	10,889	32.1	7,811	250
Brassware	428	1,410	4.2	1,011	140
Arms	432	3,120	9.2	2,238	420
Iron	183	1,103	3.3	791	330
Gunpowder	1,161	15,113	44.5	10,841	830
Total	4,683	33,934	100.0	24,343	
Source: Dumbell MS-10-50 (1-2).					

PART TWO: THE BEAD PRODUCERS

If Venice had not been able to consolidate its presence and strength in the bead export market during the previous centuries, it would not have been in a position to benefit from the marketing success of WD&Co. The authorities of the Republic of Venice correctly judged that the inherent strength of the glass-bead industry could offset the weakness shown by the other sectors of the glass industry (e.g., mirrors and luxury transparent glass) and thus merited its full diplomatic support in the effort to penetrate the English market. Even if Bohemia may have taken the lead to supply WD&Co., a joint effort by State officials and the private glass manufacturers of Venice was able to fight back and gain market share from its European competitors, based on quality, price, and credit terms. The focus will now turn to those aspects of the manufacture of beads in Venice that made this possible, when other sectors of the Venetian glass industry had already failed to keep up with European competition.

The Evolution of the Glass Industry of Venice

Venice and its island of Murano have become synonymous with the excellent craftsmanship of the transparent *cristallo* glass vessels that captivated the luxury market of Europe from the 15th century onwards (Verità 1985:17-29). Care must be taken, however, that when Muranese *cristallo* is conscripted into the theories on luxury goods and patterns of consumption of the early modern period, the process does not unwittingly transform its historical production

levels into a dominant role to the exclusion of all other Venetian glass manufactures.

The problem lies in that the historiography of Venetian glass is devoid of quantitative production and export data until the end of the 17th century. The historians of the Venetian glass industry have repeatedly drawn attention to this lack of data: “sparsely documented” (Luzzato 1961:55);¹³ “on the exports of... window glass and Muranese mirrors... the documentation is very scarce and is reduced to sporadic hints” (Sella 1961:59);¹⁴ and “we have no statistics on glass production to tell whether the entire industry shared in the sixteenth-century expansion” (Rapp 1976:7). It is only for the second half of the 18th century that there is a detailed quantitative database of glass exports from Venice, and Campos (quoted in Caizzi 1965:146) identifies glass beads as the leading export of the Venetian glass industry of that period. More recent research by Trivellato (2000:219-245) has established in greater depth the economic role of the exports of Venetian glass beads with respect to total glass exports in the period from 1769 to 1796.

Overall the nature of the Venetian glass industry is best summed up by Luzzatto even though he was writing about the 15th century: “the industry that manufactures both for general consumption and for the luxury market... is the Venetian glass industry... this utilitarian and commercial production that up to a point can be described as mass production, was not only not abandoned but continued to become the quantitative nerve of the industry of Murano.” He then identifies the paradox of the historiography of Venetian glass: “but even if from an economic viewpoint it is still the production of objects of [mass] consumption that

by far predominate, the great fame [of Murano is] its artistic glass” (Luzzatto 1961:198-199).¹⁵

The lack of quantitative data prior to the 18th century makes it very difficult to judge whether the detailed economic picture of the glass industry provided by Trivellato for the 1750-1800 period represents a historical singularity which has to be explained in terms of a sudden readjustment of the Venetian glass industry to external events or whether it is the outcome of a *longue durée* process that slowly shaped the survival of the fittest sectors of the industry in the face of global opportunities and European competition. To help answer this question, we will examine Venetian glass production and exports starting at the end of the 16th century.

Venetian Glass Exports in the 16th Century

Corti (1971:649-654) has published his transcription of a document that provides the earliest known, extensive, quantitative breakdown of Venice’s total annual glass sales according to geographical destination, along with an indication of the represented glassware categories. It is a market intelligence report that Corti assumes to have been written in 1592 by a Tuscan resident in Venice to assist the Granduca Ferdinando I de’ Medici revitalize the glass industry in Pisa. Attention should be drawn to some other levels of interpretation of the data reproduced in Table 6 that have until now not received sufficient attention. First of all, it provides the first historical quantitative indication of the role of glass beads within the aggregate of Venetian glass exports. The table shows the breakdown in value of glass exports as follows: at least 22% in mirrors, at least 7% in beads, and a ceiling of 70% that includes all types of glass vessels for liquids (including fine crystal), glass lamps, plus an unknown percentage of common glass for windows.

The Venetian Glass Industry in the 17th Century

The only information for this period is qualitative, so only the main developments will be dealt with. The Muranese glass mirror and luxury glass sectors are reported as suffering from the competition of new technologies. In the words of Trivellato (2006:152-153): “during the last twenty-five years [of this century]... revolutionary inventions and innovations introduced in England, Bohemia and France challenged the supremacy of Venetian glass technology.” In marked contrast, “For the Muranese industry of beads the seventeenth century was a century of prosperity... the second half... of notable expansion. It is significant that this qualitative judgement derives from the healthy market for

Table 6. Breakdown of Glass Exports from Venice, 1592 (in ducats).

Venice city	25,000
Terraferma and Lombardy	15,000
Sicily, Naples, Rome, and Puglia	12,000
Constantinople	10,000
Alexandria, Egypt	5,000
Aleppo, Syria	20,000
Germany	3,000
Lisbon	10,000
Spain and Indies (of which <12,000 ducats as <i>margherite</i> , <i>smalti</i> , <i>contarie</i> and <i>paternostri</i>)	42,000
Sub-total 1	142,000
To the world as unfinished mirrors Sub-total 2	40,000
Total	182,000
Adapted from Corti (1971:652-653).	

Venetian beads in the East—Alexandria, Cairo, Upper Nile Valley and Abyssinia,” though no quantitative data are provided (Sella 1961:66).

Glass Production and Exports in the 18th Century

Much more quantitative data is available for the 18th century, especially for the period 1750-1800. Trivellato (2000:219-245) provides a very detailed breakdown of the geographical export profile (in weight and value) for the four main glass categories produced during this period: *conterie* (drawn beads), *perle a lume* (lampworked beads), mirrors, and window glass. As Figure 6 illustrates, glass beads now constitute the most prominent Venetian glass export and, in value, comprise about three quarters of the main glass export revenues, with mirrors second and window glass a distant third. The average over eight annual records between 1769 and 1796 is 593,317 ducats for exports of *conterie* and 270,524 ducats for *perle a lume*, derived from an average glass export total of 1,195,912 ducats. In weight, this corresponds to an annual average of 463 tons of *conterie* and 162 tons of *perle a lume* (adapted from Trivellato 2000:230-232). Glass beads had become the dominant sector, in value, of the Venetian glass industry by the second half of the 18th century.

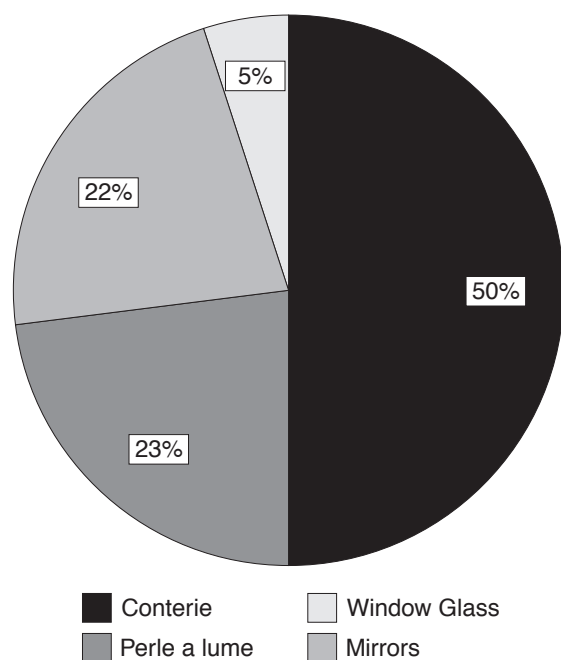


Figure 6. Breakdown of export value share of the four main export categories of Venetian glass, 1769-1796 (after Trivellato 2000: 230-231).

The Survival of the Venetian Bead Industry

What gave the Venetian beadmakers the ability to compete against other European producers when neither *cristallo* nor large glass mirrors had managed to hold out against new entries? One of the reasons lies in the characteristics of Venetian glass canes, many of which were used to make *perle a lume* elsewhere, such as France. In a letter to the *V Savi* dated September 1776, that describes a visit to a bead-production facility in Paris, Giorgio Barbiera states that he was suspicious of the fact that he saw no trace of the manufacture of glass canes there. He also reported that Venetian canes fetched three times their price when sold outside of Venice (Morazzoni and Pasquato 1953:34). The mastery of the technology to make canes remained one of the major obstacles to competition. The cost of purchasing Venetian canes at a premium was always less than the expense of having to develop a parallel manufacturing facility. The challenge was not only the technological aspect of drawing the canes, however. It also involved the glass recipe required for making beads, recipes quite distinct from those for *cristallo*, mirrors, and window glass. How is it possible to deduce this?

In the *Codice Donà dalle Rose* at the library of the Museo Correr in Venice is a document entitled “Folio in which are revealed all the costs and all the products of

every one of the glass furnaces of Murano.” It sets out in a comparative fashion the different operating costs incurred by the glassworks of Murano depending on the category of glass being produced (*Codice Donà*). It is reported that the context for this information was the proposal by the *maestri* of Murano in 1779 to constitute a single society for the production of glassware as a solution to the problems facing the glass industry at the time (Zecchin 2010:15-26). The correlation of the data in the document provides unique insight into the differences between the glass recipes for beads and those for all the other glass products of Murano. The original compiler of the table failed to include the production by weight of each of the glass categories, so it is necessary to work on the basis of the total value of each production.¹⁶

The relevant data from the document have been recalculated in ducats and, together with calculations of the relevant internal correlations, are summarized in Table 7. The production of glass canes for beads involved the highest percentage of costs incurred for raw materials (39%) compared to the rest of the Murano glass products. This large share of total raw material cost is not, however, commensurate with the contribution to total revenues from the production of beads (25%). In the absence of production data by weight, there are two possible explanations for this: a) if the recipes involved the same ingredients across all glass products, then glass canes dominated total output in weight but were sold at a very low price per weight compared to all the other glass products or b) the ingredients used for the cane glass recipes were special and thus very expensive compared to the cost of raw materials for all the other glass.

To examine the first option, it is instructive to examine Trivellato’s data for the period 1769-1796. As seen in Table 8, the mass output of glass beads was second only to that of window glass. This explains why the share of raw material costs of bead and window glass production were the highest compared to the rest of the glass products. Yet the price per unit weight of window glass was the lowest compared to beads and mirrors, so the first explanation can be ruled out and the evidence points to the very high cost of the recipe ingredients required to make glass canes for beads.

“At this point I draw attention to the fact that lead based glass was well known in Venice and was the base for coloured glass canes and *conterie*” (Toninato 1982:12).¹⁷ Lead oxide was needed to lower the temperature at which glass could be worked at a lamp burning animal fat to make the *perle a lume*. Multiple special pigments of high purity that would not whiten, volatilize, or interact within

Table 7. Economics of Murano Glass Workshops, 1779.

Products	Furnaces	Raw Materials (ducats)	Total Costs (ducats)	Revenues (ducats)	Manpower per Furnace	Contribution to Total Revenues	Cost of Raw Materials to Total Raw Material Costs	Profits (ducats) per Furnace per Unit Cost of Raw Material
Window glass	16	49,575	115,592	157,696	13	33%	27%	0.05
Common glassware	2	22,994	41,235	52,800	37	11%	13%	0.25
Large mirrors	2	8,714	22,776	39,174	15	8%	5%	0.94
Fine crystal	2	23,845	36,307	85,161	18	18%	13%	1.02
Small mirrors	2	6,955	13,918	25,548	14	5%	4%	0.84
Glass canes	4	71,025	95,906	120,032	16	25%	39%	0.08
Total	28	183,107	325,734	480,412				

Source: *Codice Donà*; for the context of original data, see Zecchin (2010:15-26).

different layers of overlaid colored glass were also required, plus individual crucibles to hold each color and lead recipe (Moretti 1975:69-70). This explains why recipes required to make the glass canes for beads were more chemically complex and so more expensive than those required for all the other glasses.

What window glass and beads do share (*see* last column of Table 8) is the need for mass production in order for the former to compensate for its very low sale price and for the latter to make up for its very high recipe cost. This underlines yet again the importance of high unit production to maintain a competitive price in the manufacture of glass beads (*see* Appendix A).

Table 8. Average Prices and Production of Murano Export Glass, 1769-1796.

Type of Glass	Soldi/g	Average Production (tons)
<i>Conterie</i>	0.16	626
<i>Perle a lume</i>	0.21	
Mirrors	0.21	156
Window Panes	0.01	791

Adapted from Trivellato (2000:230-231).

CONCLUSIONS

Venice managed to compete for market opportunities such as afforded by England's predominance in the slave trade during the second half of the 18th century, not because of a sudden shift from *cristallo* and luxury mirrors to beads, but because Venice had established its strength and presence in the international bead market through a *longue durée* process of technical and market development. The evidence points to protective barriers built up over two centuries that helped to shield the Venetian bead industry from other European bead-production centers such as Bohemia.

For the glassmakers and authorities of Venice, beads represented not only a major contribution to total Venetian export revenues, they also symbolized the continuous fight for survival of the Venetian glass industry through the centuries. It is possible to estimate from raw data that the order of magnitude of total glass production in Venice grew from around 800 tons in the 16th century to over 2,000 tons in the 18th century. During this time glass bead exports rose tenfold in value, from at least 7% to over 70% of total glass exports.

The contribution of glass beads in maintaining the continuity of the traditions of Murano glass during the critical 18th century, when its *cristallo* and mirrors had

been displaced by other European glass production centers, merits a higher profile in the historiography of Venetian glass. As Luigi Zecchin has so rightly pointed out (quoted in Trivellato 2000:239), the history of glass beads is a story that remains to be written. The trade networks of these beads and the quantitative trail they left within Europe and the rest of the world need to be followed up even further afield in time and space than has been possible here.

The strength and survival of the Venetian glass bead sector in the 18th century instilled in its craftsmen and politicians a sense of collective pride in this global achievement, a sense of having recovered the rightful place of “Venice venerable Mother of the art of glass” (TNA: PRO SP 99/73:113r).¹⁸ This sentiment of the period, which comes across in many of the primary sources that have sustained this study, is sometimes lost in the way historiography has at times belittled the role of glass beads. Part One of this article endeavoured to show that for Liverpool slave traders such as the Earles and Davenport, glass beads were never trivia but a critical factor in the success of their barter trade in Africa, goods chosen with the greatest of care in the absence of which their Africa trade suffered. Their detailed account books also seriously question the idea that African traders were gullible enough to barter slaves for a handful of beads. The few complete accounts point to a barter rate of at least 200 kg of beads for one slave at the end of the 18th century, and a barter value per pound sterling spent in Liverpool second only to gunpowder. The very low price of a single unit of glass beads that was made possible by the scale of production in Venice should not be confused with the actual level of barter value as evidenced in the account books of the Liverpool slave trade.

The European slave trade represents a heinous chapter in the history of all those involved, but it cannot detract by association from the art, beauty, and technical achievements embodied in Venetian glass beads. During the second half of the 18th century, glass beads were part of the global trade patterns established between Europe, Africa, and the New World. Glass beads cannot be eaten, they do not protect against the elements, they were not made to kill or destroy structures, they cannot serve as containers, or be forged into strong tools. In spite of this they were one of the eight main categories of cargo bartered for slaves in Africa by traders from Liverpool. They were not found in nature like cowries, corals, or arangoes but had to be expressly manufactured by a skillful chemical and physical process that was perfected in Venice. Venetian women and men were involved in a production sequence that turned out millions of beads per year by the 18th century, to be traded in their near totality to destinations outside Europe. Venetian glass beads are thus among the most important man-made, mass-produced

objects to first target intercontinental markets, based exclusively on aesthetic appeal and not on functionality.

It is thus fitting to close with the proud and hopeful words of Giovanni Malazoti who, together with other Venetian bead manufacturers, wrote in 1754, as the European slave trade started its major period of growth: “May God allow it, that we may be able to supply the orders that derive from a doubling of business... we have no memory of so many orders in other times... from Holland, England, Spain, Portugal, Alexandria and other places in the East... in Bohemia they make *conterie*, but not as good as those of Venice” (Cinque Savi Diversorum).¹⁹

APPENDIX A. CALCULATION OF THE ANNUAL PRODUCTION OF GLASS BEADS IN VENICE

The account books of the Davenport slave voyages list beads by the bunch and by weight. It is assumed that the beads sold by the bunch correspond to a size equivalent to large *perle a lume* and *rosettas* (G. Moretti 2005:32); the beads sold by weight, the smaller *conterie*. The bunch weights derived from 730 individual cargo registers of 40 slaving voyages during the period 1761-1782 (Davenport Accounts) indicate that, on average, a bunch of 100 beads weighed 4 pounds, so each bead in a bunch would have weighed around 0.04 pounds or 18 grams (Figure 7). According to data provided by Trivellato (2000:230-231) for the period 1769-1796, the average weight of exports per year was 340,628 *libbre grosse*. At 477 g per *libbre grosse*, this corresponds to 162.5 metric tons of *perle a lume*. Assuming that beads sold as bunches in the Davenport accounts correspond to *perle a lume* or their equivalent in size/weight, the weight of Venetian exports of these beads was equivalent to 9 million beads per year (162.5 metric tons is equal to 162,500,000 g which, divided by the weight of an average bead [18 g], equals approximately 9 million beads). The units of *conterie* would be at least one order of magnitude greater since, by weight, their total export quantity was around three times greater and, on average, their size and weight could be substantially smaller than the *perle a lume*.

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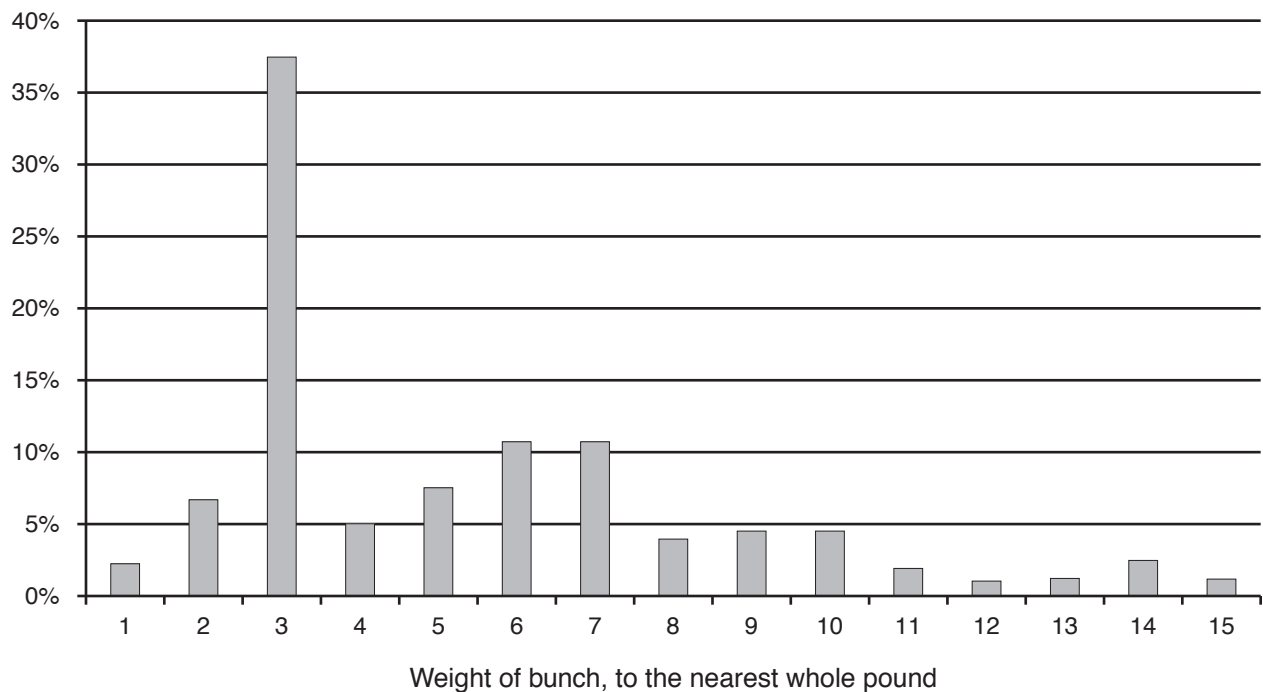


Figure 7. Percentage distribution of weights of bunches of beads (Davenport slave voyage accounts).

assistant, Ms Katie Ankers, were of great help in searching the slave trading records. In Venice, I received generous guidance from Mrs. Clementina Albano, Head of the Document Section at the Stazione Sperimentale del Vetro in Murano, and from Sigg. Gianni and Giuliano Moretti of Ercole Moretti & F.lli, Murano.

ENDNOTES

1. “Molte sonno le commissioni che... questo... Sign. Resid^{te} Vignola alla Corte Brittanica nel proposito d’introdurre con quella Nazione un diretto commercio di Contaria... nella Nazione Inglese” (all translations by the author).
2. “Vignola... propone a V. S. un com^o [commercio] colla Comp^a [Compania] di Liverpool... de Contarie di Venezia, termine per altro che in frase inglese comprende non solo quel, que noi a Venesia chiamiam Contarie ma anche le manif^{te} [manifatture] a Suppialume.”
3. “Cinque barili contarie” and “tre casse manuffature a lume” for “Gioberto Vigne, suddeto inglese” for a total of some 7,000 pounds [*grossi*] or over 3 tons of glass beads in total.
4. “Non potendo più gli olandesi venderla di seconda mano é di contrabando a Inghilterra.... si formò una ricca Compagnia di Mercanti a Levurepool... un utile traffico con le Regioni Africane.”
5. “Alle arte sono a confessione del Direttore stesso non solo ben fatte ma superiori di lavori Boemi.”
6. “È certo che se Venezia... si ingegnera a dare a prezzi... le Manuffature di Boemia... attrerà in avvenire arte stessa tutte le commissioni di Londra, Levurepool e Bristol.”
7. A Thomas Hodgson is reported as dying in 1773, and another Thomas Hodgson in 1803, but it is impossible to determine if either corresponds to the partner in WD&Co. William Davenport died in 1797 (Pope 2007:200).
8. The assumption is that the weight refers to *libbre sottili* because the trader is dealing in *conterie*.
9. The voyage accounts in the Davenport Papers span more than 20 years (1761 to 1782) and 9 pence per pound is a price that figures in the majority of the accounts reflecting beads purchased in England with only a few exceptions.

10. Account Books of the voyages of the *Tyrell* (1761), *Plumper* (1762), *Little Brittain, Sisters, William* (1764), *Henry* (1765), *King of Prussia* (1767), *Neptune, Dalrymple, William* (1768), *Henry, Dobson, Fox, King of Prussia, Hector, William, Andromache* (1769), *Swift, Dobson, Fox, True Blue* (1770), *Lord Cassiles, Hector, King of Prussia, Dalrymple, Andromache, Swift, May* (1771), *Swift, May, King of Prussia, Dreadnought, Badger* (1772), *Hector, Andromache, Swift, Dalrymple* (1773), *May, Lord Cassiles, Badger, Dreadnought* (1774), *Badger, Dalrymple, Swift* (1775), *Badger, Dreadnought* (1776), *Hawke* (1779, 1780), *Preston* (1781, 1782), and *Quixotte* (1783).
11. Spirits are excluded in this analysis because their prime cost is reported but no bar value is given, for reasons not specified in the source. The data in Figure 4, however, account for 82% of total cargo value, including provisions, so the exclusion of spirits (on average 8% of total cargo prime cost, with the remaining 10% corresponding to sundry goods) is not considered to affect the overall trends observed in the data.
12. Dr. Giorgio Riello (University of Warwick) has suggested that these data may correlate with the fact that textiles, iron, and brassware were manufactured by African industry, while gunpowder, glass beads, and firearms were not.
13. “Scarsamente documentato.”
14. “Sulle esportazione di... lastre di vetro e specchi muranesi... la documentazione è scarsissima e si riduce a sporadici accenni.”
15. “L’industria che produce per i consumi più comuni e l’industria di lusso... è l’arte vetraria veneziana... questa produzione di carattere utilitario e commercial, che fino ad un certo punto si potrebbe qualificare come produzione di massa, non solo non è abbandonata, ma seguita a costituire quantitativamente il nerbo all’industria di Murano... ma se del punto di vista economico prevale ancora di gran lunga la produzione di oggetti di largo consumo, la grande fama [di Murano] il vetro artistico.”
16. Weight output by furnace would have varied considerably subject to glass category and, in the absence of unit pricing and product breakdown, there is no key to convert total value of production to weight of output by product.
17. “A questo punto osservare che il vetro al piombo era ben noto a Venezia e costituiva la base degli smalti e delle conterie.” A technical discussion concerning the chemistry of these recipes is beyond the scope of this study but is important in the overall analysis of the reasons why Venetian beads were able to maintain a dominant role in the international marketplace.
18. “Venezia antica Madre de generi vetrari.”
19. “Valese Dio, che supplir si potessero le commissioni che in oggi derivano che un duplicato commercio... non se’ ha memoria che tanto e così abbondevoli commissioni in tempo alcuno... derivano dall’Olanda, dall’Inghilterra, dalla Spagna, dal Portogallo, da Alessandria et altri luoghi del Levante... in Boemia si fabbricano contarie non riuscite al grado che la Venete.”

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BOOK REVIEWS

Ukrainski narodni prykrasy z biseru (Ukrainian Folk Beaded Adornments).

Olena Fedorchuk. Svichado Publishers, P.O. Box 808, Vynnychenko St. 22, Lviv 79008, Ukraine. 2007. 120 pp., 111 color figs., 70 sepia and B&W figs., 45 diagrams. ISBN: 978-966-395-016-7. US \$79.00 (hard cover).

Written in Ukrainian, this book initially explores the origins and growth of artistic beadwork in the territory of the Ukraine. Most of the book is dedicated to folk adornments and ornamentation made of beads, a unique phenomenon of Ukrainian culture of the 19th-20th centuries which is little known in the world even, unfortunately, in the Ukraine. The methodology of production and artistic composition of these once very popular additions to Ukrainian folk costumes is described in this book for a wide audience.

The preface introduces the subject and informs the reader that the production and use of beaded objects is a long-standing tradition in the Ukraine. In the 19th century, or perhaps earlier, Ukrainian villagers became fascinated with beads. Women used them to embellish their clothing with additional layers of accessories. In time, beaded adornments became an integral part of the costume for holidays and special occasions. They were used in everyday wear in certain regions of western Ukraine; i.e., today's Ternopil, Chernivets, Ivano-Frankivsk, Transcarpathian (Zakarpattia), and Lviv oblasts. Beaded adornments also originated in certain villages of the Volyn, Rivno, Zhytomyr, Kyiv, and Cherkasy oblasts. The tradition of beading kept on in the west well into the 20th century. For some reason it stopped in the east, though some isolated pieces can still be found. Beaded adornments, as well as other folk art, are part of the culture of a certain land, and more narrowly, certain villages, so the unique use, form, design, motifs, and colors of the decoration were the carriers of important information about their owners/wearers.

The chapters that follow provide more details about the material mentioned in the preface. The first chapter, "Through the Pages of History," starts off with the "Earliest news about adornments made of glass." It is followed by a section about "Glass objects of ancient (Kyivan) Rus Times" which were heavily influenced by the Byzantine

Empire. There are illustrations of the different beads and glass bracelets. Next comes the "Artistic Production" of the 14th-19th centuries. Here we see examples of icons, church vestments, and sacred artwork. There follows "Adornments from Glass and Beads in Ukrainian Folk Dress." The characteristic elements of Ukrainian national dress evolved during the 14th-17th centuries in the heart of the village and during "kozak" times. From this time to the mid-20th century, the development of national cultures was centered in the village. Thereafter, beadwork lost its popularity. As villages became industrialized in the late 20th century, their national character was ruined.

The chapter on "Technique Fundamentals" reveals that beadwork techniques and designs were passed down from generation to generation and beaders were constantly working out new ideas and innovations. The beads used are discussed followed by a description of stringing materials and their uses. Techniques are introduced and described step-by-step in the text. Diagrams illustrate the start of each technique and a few additional steps if necessary. Occasionally beads are numbered in sequence to help readers bead on their own. Stringing is the most basic technique followed by "stringing on two threads" to create "chains" and "ladders." This is where the diagrams begin to illustrate the different variations possible within each technique. They clearly show the difference in designs by color placement, amount of beads on each needle, and how the size and shape of the beads can affect the look. Other techniques discussed include multi-needle beadweaving, stringing on one thread, preparing chains, netting, creating wider beadweaving, preparing netted collars, preparing trims, and loomed beadweaving. In the section on "Bead Embroidery Technique," the author explains that bead embroidery goes back to ancient Rus times when it was done with gold and pearls. In the 19th-20th centuries bead embroidery was used primarily on headdresses and on sashes.

The chapter on "Typology of Adornments" outlines the different kinds of Ukrainian beaded folk adornments of the 19th to mid-20th centuries. There are 18 styles of beadwork starting with *monysto*, strings of beads from ancient times and continuing through history. The styles differ in construction method and ornamentation. The author describes each in

detail. Sepia-toned photographs illustrate each point.

“Ornamentation of Adornments” reveals that beaded Ukrainian adornments were a part of the artistic-pictorial structure of the ensemble of folk costume. Therefore their ornamentation was closely related to the ornamentation of the fabric and embroidered components of the costume. In this lies its uniqueness. The style of design possibilities was greatly dependent on the technique with which the beadwork was created. Therefore, in the early 19th century, the most popular designs on the multi-needle or straight bands were geometric ornamentation with steps and straight-edged motifs. More fluid designs became possible only with bead embroidery. Thus, most beadwork of the 19th to early 20th centuries is geometric in form. The author discusses the most commonly used ornaments and their meaning.

The chapter “Illustrated Addition” consists of 110 full-color photographs of beadwork from archives, museums, and private collections. Each piece is thoroughly identified. Most examples are multi-needle or netted, and sometimes loomworked or uniquely beadwoven. There are many styles of necklaces, collars, and medallions, and items trimmed with coins.

There is also a glossary of beadwork terminology, ornamentation, and adornment styles, a bibliography, and a poorly written, one-page English “Summary” (p. 68), none

of which are mentioned in the table of contents.

This is the first Ukrainian-language book which combines so much material about beaded adornments into one volume. The author has a good grasp of the history and categories of beadwork and ornamentation. The descriptions of every beadworking technique are concise and there are plenty of photos on each page to illustrate the text. The book’s liners with the ethnographic map of the Ukraine in the front and the typology tree of the four beadwork categories in the back are graphic and easy to understand.

Although in Ukrainian, this book is worthwhile for non-Ukrainian readers because of the wealth of information that is presented in a visual way. Between the sepia photos, diagrams, and color photos of beadwork in museum collections, one can really get a good understanding of the significance of beaded adornments of the 19th to mid-20th centuries in the Ukraine.

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Plate IA. Bauxite: **Top:** Forming bead blanks from the rough stone at Abompe, Ghana. **Bottom:** Using a bow drill to perforate the beads (all photos by the author unless otherwise noted).

Plate IB. Bauxite: **Top:** Boadu carrying a load of dug bauxite (courtesy: Emily Henke, Global Mamas). **Bottom:** Bauxite chips in a crack in the rock floor of the large Abompe cave.

Plate IC. Bauxite: **Top:** Boulder of dark stone with a 60-cm-long polishing surface. **Bottom:** The largest polishing stone, 4 meters long, close to the larger Abompe cave.

Plate ID. Bauxite: **Top:** Digger Sam at the mouth of his pit. **Bottom:** Sam's partner, Boadu, digging bauxite using a digging stick with a chisel-like blade (courtesy: Emily Henke, Global Mamas).



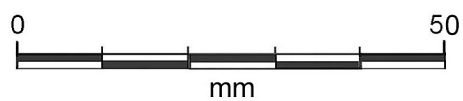


Plate IIA. *Chotuna*: Bead varieties 1-10C (all photos: C. Donnan).

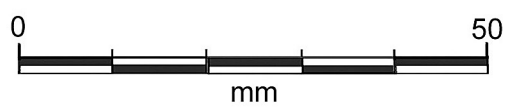
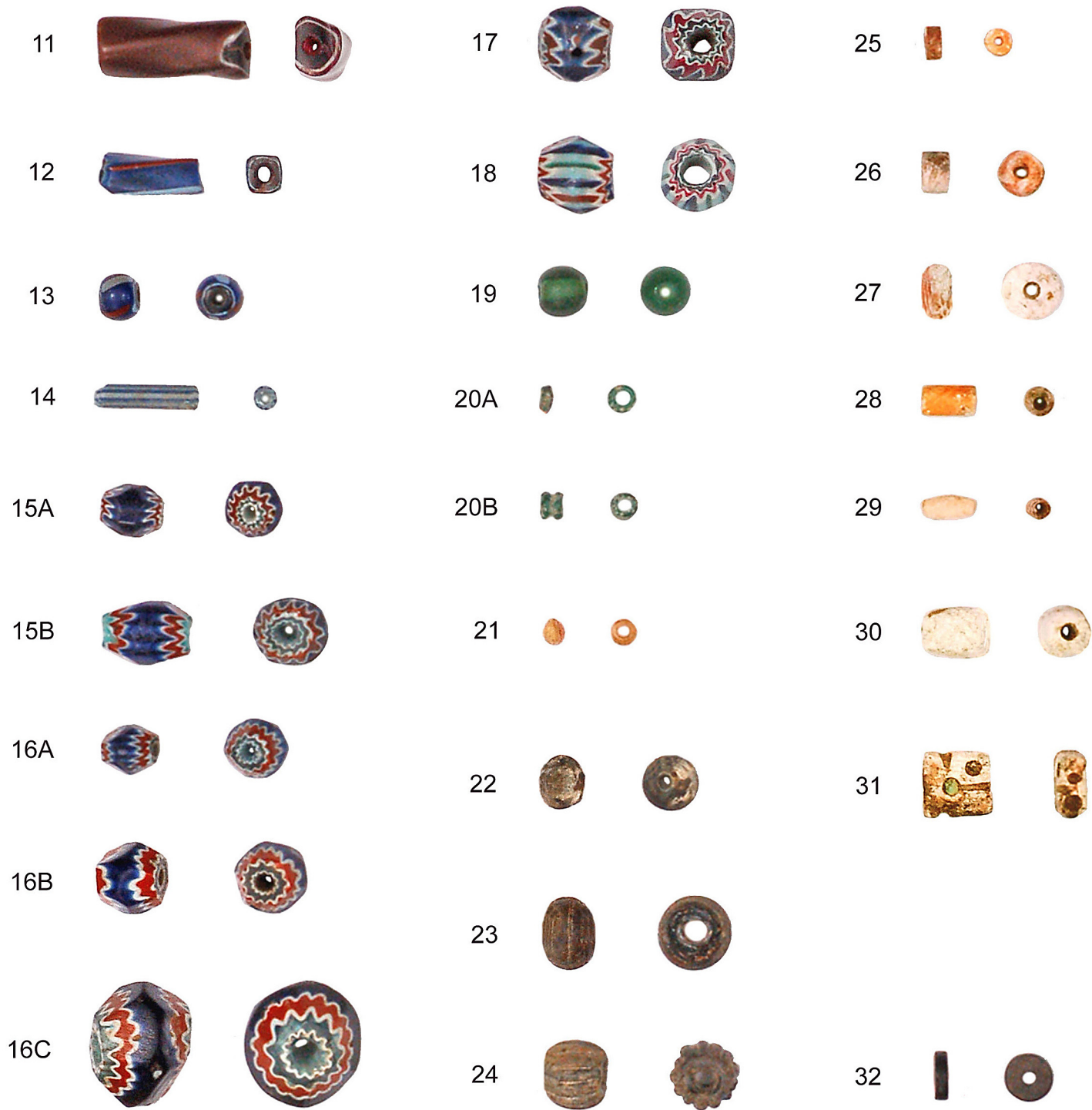


Plate IIIA. *Chotuna*: Bead varieties 11-32.

9C



10C



12



13



14



17



18

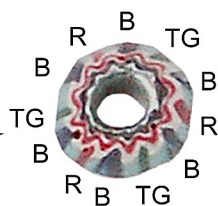


Plate IVA. *Chotuna*: Enlarged views of select bead varieties. Variety 18 stripe colors are blue (B), translucent green (TG), and red (R).

Plate IVC. *Chotuna*: Burial 1, an infant, during excavation.



Plate IVB. *Chotuna*: Burial 1 (lower left), Burial 2 (right), and Burial 3 (upper center) during excavation.

Plate IVD. *Chotuna*: The beads at the right wrist of Burial 1.





Plate VA. *Chotuna:* The beads at the left wrist of Burial 1.

Plate VC. *Bahamas:* **Top:** Tyler G. Hill sorting shell artifacts from the 2010 excavation at the Minnis-Ward site (SS-3)(photo: R. Kim). **Bottom:** Shell beads in various stages of manufacture recovered in 2004 from SS-3/04-2 at the Minnis-Ward site (ca. A.D. 985)(photo: J. Blick).



Plate VB. *Bahamas:* **Top:** The 2009 2x2 m excavation at the Minnis-Ward site (SS-3), San Salvador (photo: J. Blick). **Bottom:** Drawing a soil profile at the site, June 2010 (photo: R. Kim).

Plate VD. *Bahamas:* **Top:** Several bead blanks and the resultant circular disc beads (SS-3/10-1). Note the unfinished drill hole in blank 2. **Bottom:** A bead blank and a variety of finished shell beads (SS-3/10-5)(photos: R. Kim and T. Hill).





Plate VIA. Bahamas: **Top:** A suite of beads from SS-3/10-4 showing the various stages of manufacture. **Bottom:** “Ghost” beads in various stages of manufacture. The fourth bead dates to ca. A.D. 985 (photos: R. Kim and T. Hill).



Plate VIB. Bahamas: **Top:** A variety of *Oliva* “tinkler” beads (ca. A.D. 900-1400). **Bottom:** Cylindrical diorite bead (SS-3/ST3-10); naturally perforated worm-shell bead (SS-3/04-3); unfinished rectangular coral bead (SS-3/ST-A9) (photos: R. Kim and T. Hill).

Plate VIC. An early historic Taíno chief’s belt with *zemi* figure from the Greater Antilles, ca. 1530. It is made of cotton and decorated with white and red shell beads, likely *Strombus* and *Chama sarda* (Museum für Völkerkunde, Vienna).

